

PERSONALITY AND PERCEPTUAL STYLE  
IN RELATION TO VISUAL ART

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*To the memory of my mother*

*Isabella Hall Trivett*

*and to my father Frank Trivett.*

**I declare that this thesis was  
composed by myself independently  
of any research group.**

**Pamela Hall Trivett**



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## SUMMARY

This study had three main objects. Firstly, to test hypotheses derived from studies relating to the Rorschach Ink Blot Test, and related tests, which have shown correlations between personality traits and perceptual styles. In particular, the study focused on the personality traits of emotionality, extraversion, intelligence and imagination, and the perceptual styles of colour, form and movement responsiveness.

The second aim was to apply these hypotheses relating perceptual style and personality to response to modern paintings. It was hypothesized that since response to visual art must be at least initially perceptual and perceptual styles are habitual modes of response, perceptual styles elicited by Rorschach and other tests should also be elicited by paintings and relate to hypothesized personality traits.

The third object was to derive measures of colour, form and movement responsiveness in relation to paintings, which as well as reflecting perceptual styles, could be said to reflect an "appropriate response" to specific works of art. Paintings were chosen as representative of Expressionist, Cubist and Futurist schools of art. From descriptions of the aims of these movements, by the artists themselves, critics, and art historians it was concluded that they rely for their effects primarily on the representation of colour, form and movement respectively. Response to Expressionist paintings in terms of colour, Cubist in terms of form, and Futurist in terms of movement was therefore considered a reflection of appropriate response, in so far as such responses reflect reaction to the aspect of the painting which the artist intended. In order to explore the relationship of measures of appropriate response to perceptual style and personality traits, these measures were intercorrelated.

In general, results confirm the hypotheses relating personality traits and perceptual styles, as measured by Rorschach, specific tests and in response to paintings.

The measure of response to painting which reflected appropriate response most directly was that reflecting percentage of colour, form and movement response to pertinent paintings. It therefore controlled for general tendency to respond indiscriminately in terms of colour, form or movement, and showed little relationship to basic measures of these perceptual styles. This measure was found to relate more closely to various cognitive styles than to personality traits.

The implications of these findings are discussed in terms of a theory which views the expression of individual differences — aesthetic, perceptual, cognitive and social — as governed by subsystems of the total personality structure.

## CHAPTER 1

### Introduction

This study does not stem directly from any past work within the psychology of art rubric. Experimental study of response to art is however in its infancy, and for this reason it is necessary that this study be placed in perspective by a brief outline and appraisal of past research and theories pertaining to response to visual art. This review comprises the first half of this chapter. There follows an account of the type of finding from which this study derives, and an outline of the theory proposed as its framework.

The most important theories relevant to a psychology of art derive from psychological theories developed in other fields of psychology — Motivation, Perception and Information Theory.

Factors compelling a person to engage in aesthetic experience and moving him to select certain types of aesthetic experience as opposed to others, concern motivation in relation to art.

Two main theories concern themselves with motivation: Freudian theory and that of Berlyne.

As with all goal-directed behaviour in the Freudian scheme, motives for seeking aesthetic stimulation derive ultimately from the id. In his version of Freudian theory in relation to art, Ehrenzweig (1962) postulates a primitive unconscious mode of perception which is undifferentiated and id-dominated. Any objects can be equated in this perceptual world. Subliminal perception is a facet of this mode of perception. The grasp of things exposed at a rate which is too swift for conscious appraisal, is, according to Ehrenzweig, due to the scanning power of unconscious vision. Hence the core of the aesthetic response is this unconscious appraisal of the subliminal structure of a work of art. The aesthetic response is a feeling of being enveloped — an oceanic sensation. The amorphous works of Pollock, Kline and Kandinsky, and the universally appealing power of the golden section, Ehrenzweig cites as examples of fodder provided by the art world for the id's undifferentiated appetite.

Berlyne (1965) invokes his theory of curiosity and arousal to answer questions concerning motivation and art. He postulates two kinds of curiosity: "specific" curiosity, which is a spur to seeking objects which are aesthetically pleasing, and "diversive" curiosity, which compels a person to seek stimulation to the optimum degree. Optimum degree depends on the degree to which configurations contain certain formal properties such as complexity and diversity. The degree to which a configuration possesses such properties determines the amount of arousal produced in the observer, and the amount of stimulation he will derive from it, as opposed to other configurations. Hence Berlyne offers an explanation of why a person seeks aesthetic experience ("specific" curiosity) and why he seeks certain types of experience at the expense of others ("diversive" curiosity, and stimulation depending on optimum amounts of diversity, complexity, and other stimulus properties.)

Gestalt theory, as applied to art, and typified in the work of Rudolf Arnheim (1956, 1966) seeks to clarify the perceptual organisation that gives rise to the aesthetic response. Gestalt theory holds that the balance and unity which an artist strives towards accelerate processes natural to perceptual organisa-

tion. The grasp of the whole configuration, independent of its parts, is paralleled in the organisation of neuro-electric brain fields. The essential qualities of a work of art are echoed in the brain organisation and the aesthetic response is the result of this isomorphism of psychological and physical processes. Other qualities inherent in a painting, for example, "sadness" are not deduced from a painting: they are there in the configuration, in the percept, and in the brain.

Dorfmann and McKenna (1966) related preference for patterns to matrix grain. They explain their findings in terms of information theory, suggesting that it is the uncertainty of pattern occurrence (calculated in terms of matrix grain) which relates to preference.

The theories outlined above indubitably illuminate various facets of response to works of art. Each approach, however, ignores individual differences in perception and judgement. Regarding information theory, the fact that different individuals attend to different aspects of a visual configuration is completely overlooked in an attempt to plumb the metrics of visual form. This criticism is a powerful one, and one which applies equally to Berlyne's theory, Gestalt, and Freudian theory. Because of their respective heritages, these theories have tended to focus on a particular aspect of response to art (motivational and perceptual) and isolate it from other psychological processes. That this is unwarranted, is the underlying tenet of this study.

While the theories so far considered may be censured for their dissociation of the aesthetic response from other expressions of personality, the studies about to be described offer a salutary corrective.

As long ago as 1919, Bullough (described in Valentine 1919) underlined the importance of taking individual differences into account, in a study which categorised subjects into various types according to their varying response to paintings. Individual subjects seemed to vary according to their use of criteria when analysing paintings. Some referred to the objective qualities of a design (colours, shape); others analysed the work in terms of their own psychological responses; others spoke of their preferences with reference to the associations they invoked for them; and still others enlivened the painting and described it in terms of human characteristics. Bullough termed individuals objective, physiological, associative and character types, according to their strategies on confronting works of art.

Osgood, Suci and Tannenbaum (1957), using the semantic differential, isolated three dimensions which were used to describe paintings. These were activity, potency and evaluation. There are variations in the degree of stress on individual places on each dimension.

Various studies using factor analytic techniques have revealed multiform dimensions used in the classification of response to paintings and designs.

Eysenck (1940) found a bipolar factor which he identified as additional versus modern, or meaning versus formal criteria. Guilford and Holley (1949) found five factors in their analysis of playing card designs. Pickford (1948) found that the factors which emerged in analysis were design, feeling and rhythm.

Irvin Child (1965) related judgement of the aesthetic merit of paintings to expert judgements in

order to gauge "aesthetic judgement". The aim of this study was to establish the correlates of aesthetic judgement or "good taste" in terms of cognitive controls or styles. The latter are habitual modes of control of needs and their expression, and they are presumably relevant to a situation where the need is aesthetic pleasure. Child postulates various cognitive controls, often assuming their relevance to aesthetic experience on the grounds of tenuous verbal analogies. "Regression in the service of the ego", for example, is hypothesised in relation to aesthetic judgement in so far as creativity may involve a regression to less mature forms of ego function, therefore the reception of a work of art, it is postulated, may also involve regression. Child found, in fact, that certain cognitive styles, (for example "scanning") did correlate significantly with his criterion of aesthetic judgement.

Child's study may be censured on two grounds. He could in fact have postulated many random variables, as well as cognitive styles, in relation to aesthetic judgement, because his study lacks a theoretical scheme and adequate hypotheses. Again, Child's criterion of aesthetic judgement, expert opinion, may not be uniform. If Child wished to find the correlates of aesthetic judgement, he used a circuitous method of doing so. The direct way would have been to study the experts' themselves, rather than to check their opinions with those of others, and search for correlates.

Despite these criticisms, Child's study possesses a high degree of technical excellence, and most important, highlights the relevance of studying the strategy evolved by a person in his confrontation with a work of art. As Hogg (1969) points out: "It is at this level that cognitive controls and cognitive style appear so relevant, and yet it is this level that is bypassed in the leap to compare evaluation with expert opinion". Most certainly, a psychology of art must consider individual methods and the processes engaged in, when orientating towards visual material.

Silver Landis and Messick (1966) point out that their failure to find one measure of complexity or geometry in visual form which will describe all dimensions used, by individuals, "isn't surprising. It is, after all, what would have been predicted from all the work on perceptual styles that has been accumulated over the past several years". They add that individual differences in strategy for dealing with visual configurations perhaps could be identified by "including measures of perceptual and cognitive styles, and, perhaps, personality and preferences."

Studies relating to response to art therefore seem to suggest that concomitant study of individual differences would be productive. A similar conclusion may be drawn from the theories outlined above, in so far as each one may be criticised for failing to take account of individual differences.

It would seem therefore that a fruitful method of research would be the study of the aesthetic response in relation to those factors which must surely bear upon it — the perceptual habits or styles and personality traits of the individual.

This study, in following this line of approach, aims to bridge personality traits, perceptual style, and response to visual art. Before outlining the theoretical framework proposed for such a study, it is



apposite to outline the type of theory from which both derive.

As will be made clear in subsequent chapters, this study takes its lead, first and foremost, from a large body of research which has corroborated the observations of Rorschach (1921). These studies have found a correlation between a person's response to social stimuli (personality trait) and his response to perceptual stimuli (perceptual style). It has been found, for example, that the trait of extraversion relates to measures of colour responsiveness. In so far as a colour responsive individual produces his response by virtue of the coloured aspects of a configuration, and variables of style describe the way a person behaves or perceives, as opposed to what he does or sees, colour responsiveness is a perceptual style. Though Rorschach himself did not use the term perceptual style, he did emphasise that "his aim was to uncover how, rather than what, a person experiences" (Rickers-Ovsiankina 1960).

Rorschach studied several "determinants" of response to ink blots (including texture and shading) but colour, form and the apparent movement in a stimulus have received the lion's share of research effort. This study focuses on the perceptual style of colour, form and movement responsiveness in an attempt to relate them to personality traits via hypotheses derived from previous research. These hypotheses are outlined in the next chapter.

The concomitant aim of this study is to explore personality traits and perceptual styles in relation to response to visual art. If there are dimensions of colour, form and movement responsiveness, it is hypothesised that these should operate in response to all types of perceptual stimuli, including works of art. In particular, it is considered appropriate to study response to modern paintings, which because of their ambiguity and abstract nature have qualities akin to unstructured ink blots.

This study therefore aimed to derive measures of response to paintings in terms of colour, form and movement responsiveness, and to relate these to measures of perceptual style and personality traits. An attempt was made to refine these measures, so that they could be said to reflect "appropriate" response to the salient features of the paintings, as well as reflecting the perceptual styles of colour, form and movement responsiveness. The rationale determining the derivation of such measures of appropriate response will be discussed in subsequent chapters. Suffice it here to say that the aim of deriving measures of appropriate response which simultaneously reflect perceptual style was to clarify the nature of response to art by relating these measures to basic measures of perceptual style and personality traits. It was hypothesised that an appropriate response is either related to, and perhaps a manifestation of, perceptual style and personality traits (in which case it will correlate with these) or it stands, as many theorists would have it, in splendid isolation.

A study aiming to explore the interrelation of personality traits, perceptual style and response to paintings, cannot stand in a theoretical void. The type of theoretical framework proposed for this study provides an interpretative scheme for hypotheses deriving from Rorschach findings relating perceptual style and personality traits, and the concomitant study of response to art.



This theoretical scheme embodies the type of personality theory which focuses on individual differences in the behaviour of persons. There are other types of personality theory: using Allport's taxonomy (1937) there are those which emphasise the mediating factors in the adjustment of an individual, or involve a quest for the biophysical bases of personality, or again those which focus on the biosocial determinants of behaviour. This study aligns itself with the view of personality expressed by Lazarus and Opton (1967): "It is the whole integrated pattern of behaviour which distinguishes one man from another as uniquely as fingerprints and as distinctively as photographs". In this scheme, it necessitates a theory of personality, to deal with any behavioural phenomenon which can be shown to possess significance for the individual and distinguish him from other individuals. The theory which does this must therefore take account of research which has furnished dimensions describing individual differences in perception, cognition, motivation and learning, and amplify the concept of personality to include those. Though it has long been axiomatic to accept that there are individual differences in the degree to which people exhibit the trait of extraversion (that is, a person typically and consistently responds to social stimuli in a way which distinguishes him from others) it is becoming increasingly apparent that there are differences among people in their methods of handling other categories of stimulus, for example, perceptual and cognitive.

Witkin (1948) for instance, has shown that individuals differ in their perception of the upright, depending on whether they use postural or visual cues. Thus, Witkin's work has shown that there are individual differences in the perception of non-ambiguous stimuli, whereas work stemming from Rorschach (1921) has shown differences in perceptual style in relation to ambiguous stimuli, such as ink blots. On the other hand, the work of Gardner (1964) has furnished the study of individual differences with dimensions describing various cognitive styles, or modes of operating conceptionally. One dimension Gardner has studied is degree of preferred abstraction or differentiation in forming concepts.

Moreover, these dimensions of perceptual and cognitive style have been shown to relate to one another and to personality traits. The most important body of research, stemming from Rorschach, and establishing the personality trait — perceptual style link has been referred to. Kagan (1966) has shown that the cognitive style involving analytical attitude (classification of objects into small units) relates to the personality trait of non-impulsivity. He could thus be said to have experimentally corroborated the intuitions of William James, when he maintained, as early as 1890, that "differences in intellectual conclusions among philosophers could be traced more to their differences in temperament than to any differences in facts available to them", (Cattell, 1968). Frenkel Brunswik (1950) demonstrated a cognitive-perceptual style link in finding a correlation between strict categorising of in and out groups (racial prejudice) and intolerance of perceptual ambiguity.

A review of such research prompts the type of conclusions submitted by Krech (1950), who states that the boundaries delineated by fields of study in psychology are arbitrary: "How many of those dis-

tinctions — perceptual learning, motivation — would remain, if we temporarily forgot our history and simply inspected our data.” This view has been echoed by many other writers, among them Bruner (1951), Witkin (1954) and Woodworth (1964). Certainly the boundaries demarcating areas of psychology have become more permeable in the light of such research. The theory about to be described is one which acknowledges this permeability; it was inspired by findings such as those outlined above, and is particularly relevant to a study which aims to span personality traits, perceptual styles and response to art.

The theory is that developed by Klein (1951) in response to the deficiencies of Directive State Theory, (see Blake and Ramsay 1951). The latter had emphasised the role of motivation in perception but had failed to take account of other individual differences. Klein’s theory essentially regards the concomitant expression of individual differences in response to perceptual or social stimuli as governed by hypothetical structures called “Anschauungen”. These anschauungen, or organising principles, are built up and modified by experience; individual differences, motives and experience operate in a feedback loop fashion to control the selection of anschauungen. This theory has appeared in the literature in various forms. “Set” or “Hypothesis” theory, for example, as championed by Bruner (1950) also posits mechanisms which control individual differences in personality trait, perception, cognition and so on, which vary concomitantly. This theory, however, conceives the perceptual process in a linear fashion, whereas Klein’s model conceives the scheme in triangular fashion, with anschauungen at the apex of the triangle controlling the expression of personality trait (for example) and the perceptual response.

This model obviously stems from a conception of personality as a force unifying the expression of all facets of the person — traits, perceptual and cognitive style, and motivation — to name a few. Cattell (1965) expresses this succinctly when he says that most fields of psychology — perception, learning, and so on — can be considered “abstracted facets of the total unitary personality or organism, in action.” Klein’s model admits specific mechanisms (or anschauungen) making up personality, to unify its various expressions.

Application of Klein’s model is primarily post hoc. When the perceptual response and attendant conditions (individual differences) are specified and noted to behave in a lawful manner, it is possible to postulate an intervening variable or anschauungen to account for this. The nature of the anschauung must be determined from the nature of the covariant personality traits, perceptual style and perceptual response. The status of the intervening variable or anschauung satisfies the canons of current experimental methodology: its existence and nature is extrapolated from a consistent and lawful relationship.

Klein’s theory provides a framework for the interpretation of correlations between personality trait and perceptual style stemming from the work of Rorschach. In fact, one or two theorists have already come close to fitting Rorschach findings into a scheme of this sort. Anygal (1948) maintains

that perceptual response to shading on a Rorschach ink blot, and its correlate, sensitivity in interpersonal relations, are both manifestations of one system. Rapaport (1946) has attempted to find an explicative model for Rorschach's findings, and in so doing, he clearly skirts *anschauung* theory. He maintains, for example, that response to form in an ink blot is paralleled in social situations by controlled formal and appropriate behaviour (see Chapter 2). If Rapaport were to go one step further and hypothesise and intervening variable controlling these two facets of a person, he would reiterate the scheme forwarded by Klein.

The model is also specifically relevant to a study spanning personality traits, and perceptual style in relation to response to visual art. The scope of the *anschauung* model permits aesthetic responses to be viewed in the same light as all individual differences. They too can be viewed as manifestations of *anschauungen* and it is permissible to use hypotheses derived from Rorschach findings as a basis for prediction in the discovery of concomitant facets of the aesthetic response. Several writers have recommended the inclusion of response to art in a scheme of this sort. Granger (1953), in a review of studies relating individual differences in personality and perception, concludes that there is no justification for isolating the aesthetic element from other aspects of perception. Bruner (1950) also upholds this view. . . "ink blots are no separate species of stimulus. There cannot be an independent theory of the perception of ink blots any more than there can be independent theories of the perception of Picasso collages, the phi phenomenon, or autokinetic movement."

One writer has actually produced an ingenious analysis of the views of two critics which uses an *anschauung* model. Hungerland (1954) cites one critic who attributes the core of Cézanne's aesthetic appeal to "volume and space. . . based structurally on the line drawing." Another critic bases Cézanne's method on "the individual patches of colour" which are "the real support of the pictorial structure." Hungerland's conclusion: "Both critics are ego involved in certain theories and their respective ego involvements determine the choice of the aesthetic objective in terms of which Cézanne is to be seen." Hungerland maintains that such ego involvements or *anschauungen* are manifest most clearly in critical assessments of works of art which do not present a structured unequivocal stimulus.

Certainly, application of Klein's model to response to paintings which are modern and relatively abstract is most appropriate. A natural corollary to Klein's theory is that *anschauungen* or organising principles will be more clearly manifest in response to stimuli which are ambiguous and weak. As Bruner (1950) stated in his "theorem of covariation" — the stronger the *anschauung* or hypothesis the less information needed to confirm it and vice versa. This principle is, in fact, the basic premise underlying Rorschach practice. It is maintained that on confronting an ink blot, a person must rely more on his own inner resources and creations in order to organise such an unstructured stimulus. In projecting his own thoughts and feelings onto the ink blot, a person thereby manifests pertinent facets of his total personality organisation.

The application of the anschauung model can be seen to be extensive. This study must align itself with the underlying concept of personality such a theory embraces. It permits perceptual styles and personality traits to be studied alongside response to art, which, within this scheme, becomes another manifestation of individual differences controlled by central mechanisms. The hypotheses linking such individual differences are derived from Rorschach's observations, and the work corroborating them. The next chapter outlines relevant studies and hypotheses.

## CHAPTER 2

### Perceptual Style - Colour, Form and Movement Responsiveness - in Relation to Personality: Hypotheses and Experimental Studies

Rorschach hypotheses, concerning the interrelation of perceptual style - colour, form and movement responsiveness - and personality, have been subjected to experimental inquiry in a variety of contexts. These include studies of the correspondence between personality variables, and colour, form and movement responsiveness on Rorschach; colour, form and movement responses measured by tests designed specifically to measure these factors; and studies relating colour responsiveness to paintings. The results, reviewed below, suggest a definite correlation between hypothesised personality traits and perceptual style.

How much overlap there is of colour, form and movement tests remains conjectural, but there is some evidence to suggest that colour, form and movement reactivity are fairly unidimensional.

#### 1. HYPOTHESES RELATING TO RORSCHACH DETERMINANTS, COLOUR, FORM AND MOVEMENT

Rorschach presented his conclusions concerning the correspondence of personality traits and perceptual organisation as empirical observations. "The conclusions drawn. . . .are to be regarded more as observations than as theoretical deductions." (Rorschach, 1921).

Today the theoretical substratum for Rorschach's observations is still slight. Theorists have attempted to relate, for example, colour reactivity to emotionality, by explaining it in terms of phylogenetic derivation, (Schaie, 1966) and amassing evidence to evince direct physiological responsivity to colour (Birren, 1961). This theory most certainly spans too wide a field, and makes deduction and testing formidable. Recourse to figures of speech and their parallel with emotional reaction, for example, rose-coloured spectacles, (Schachtel, 1943), is further semantic evidence for the association of colour and emotion, but hardly an explanation. That evidence suggests innate dispositions in animals to respond in definite ways to colour, physiological reactivity to colour, and parallels of the colour-emotionality link in speech, are all manifestations of colour relating to emotion, but they do not amount to a theory. Furthermore, theories concerning the interrelation of other determinants and personality have remained noticeably frozen. Most speculation has concerned itself with colour, and yet form and movement are just as important and in need of explanation.

An exposition of Rorschach hypotheses concerning determinants and personality often devolves upon a list of seemingly arbitrary equivalences. These are, however, valid empirical observations. The position must be viewed from this angle: the most potent demonstration of the relationship of personality variables, and colour, form and movement responses has been the Rorschach "experiment", which is, to quote Schachtel (1943), "by far the most convincing and comprehensive". Rapaport (1946) also aligns himself with this position: "We do not fully understand how it happens, even though our experience

and statistical data demonstrate that it does happen, that the subjects behave towards the coloured ink blots as towards affective stimuli, towards the shaded ink blots as towards anxiety arousing stimuli, and towards movement impressions in the ink blots as towards ideation-mobilizing stimuli." Taking these findings as a starting point, the most feasible scheme into which to fit the various Rorschach observations is that viewing responses to ink blots as one aspect and manifestation of a person's personality organization. Individual differences in perception, and personality traits contribute to the outstanding and recurrent patterns of behaviour which distinguish one person from another and constitute, in toto, a personality. Klein's model (1951), reviewed earlier, would posit various subsystems (*anchauungen*) within the total personality organization, which govern the concomitant expression of perceptual style (for example colour responsiveness) and personality trait (for example, extraversion).

A similar framework is provided by Freudian theory. Drives and instincts, according to this theory, can be mastered by conscious aspects of the personality or ego. In an interpersonal context, the conscious control of instincts is manifested by due control of emotional expression, while weak ego control gives rise to emotional outbursts and impulsivity. In a perceptual context this conscious control is manifested by consciously controlled form perception and lack of it is shown by immediate colour response.

In interpreting a Rorschach protocol the first task is the statement of a general hypothesis in terms of preponderance of determinants, usually assessed from the psychogram. This general hypothesis involves indicating whether the protocol under consideration shows predominance of colour, form or movement responses. Responses determined by each of these have been shown in Rorschach experience to relate to certain personality characteristics. Below, colour, form and movement as determinants for responses are outlined and their meaning in terms of personality factors discussed. An analysis of the perceptual organization involved in the production of a response determined largely by colour, form or movement is outlined. This exposition is in line with that submitted by most theorists. The next step is the alignment of this analysis with the fact that subjects responding to colour are doing so as they would respond in a more global context to affect, and this analysis is carried over, *mutatis mutandis*, to form and movement responses.

#### **A. Colour Responses**

Colour responses dealt with under this heading are those determined primarily by colour, and scored GF, and C, or, colour used in a concept referring to an object of indefinite or vague form (Klopfer's system 1954. See Glossary, Appendix F). It will be seen from the analysis below that FC responses should not be considered under this rubric, and do not have the same implications. Moreover, Wittenborn (1950) found that a factorial analysis of Rorschach responses revealed FC responses to be independent of CF and C responses.



Subjects presented with Rorschach ink blots are asked to say what the blots might be or what they might represent. The subject is, therefore, presented with a problem, that of producing a communicable concept from the blot impression. The coloured elements in the blots are regarded as a challenge, presenting the difficulty of integrating the coloured areas with form. If the subject succeeds in integrating colour and form and producing a definite concept, the response is scored FC. If he fails, he produces a concept which is determined mainly by colour, with little integration of form and colour; this is CF or C.

A colour-determined response is one in which the coloured areas of the blot have become valent, since everyone sees the colour areas, but not everyone reacts to them. If the perceptual process is regarded as one which involves interpretation of sensory data in the light of past experience, motives and associations, then in order to produce a concept, colour areas must be integrated with form, and this implies in Rapaport's term, "cogwheeling" of associative processes which eventually produce an integrated FC concept. Rorschach states FC is "an associative as well as emotional response". A CF or C response is one in which the associative cogwheeling has been short-circuited. The response is stimulus determined, with no effort on the part of the perceiver to structure the configuration. Hence this colour dominated perception is, in Rorschach's terminology, extratensive - superficial, stimulus determined and passive.

This analysis of perception, in which associative processes play a predominant role, gives rise to a twofold classification of colour responses: they are at once immediate and passive, or superficial, because they imply no recourse to individual experiential associations.

There is no theory which obviates a specific colour-responsiveness-emotionality hypothesis on empirical grounds alone. The hypothesis rests on a foundation of clinical experience. Colour is not only a challenge to perceptual integration; it is also an emotional challenge, and, moreover, these two difficulties, perceptual and emotional, are inextricably intertwined. The literature on colour shock stands as testimony to this.

In writings relating colour responses to affectivity, it is often hard to disentangle argument by analogy from a situation which is clearly argument based on empirical observation. For example Klopfer's analysis (1954) slides smoothly from the statement, "To integrate colour within the framework of the task represents a challenge to many subjects. . .", to ". . .the way in which a subject handles colour gives an indication of his mode of reacting to an emotional challenge from his environment."

Therefore the bridge between the perceptual articulation of coloured areas in the ink blots, and personality factors is a hypothesis drawn from empirical data, which states that the way a person deals with colour mirrors his response to emotional aspects of the environment.

Given that colour represents an aspect of affective input, predominance of colour responses would indicate an emotional disposition toward the environment. The very fact that a coloured area has elicited a response means that this stimulus, equivalent to an emotional one, has made its mark.

Since colour-dominated responses are immediate responses to affective input, without the delay entailed by the operation of associative processes, they indicate a propensity not only for emotional reactivity, but for emotionality which is impulsive. Rapaport's explanation enlarges on this. He considers affect as a momentary derivative of instincts which press toward immediate need gratification. Smooth discharge of affect is a way of gaining need satisfaction in response to affective stimuli. This smooth secondary discharge is viable only when there is delay in order to assess reality and direct affective output. When not enough affect is available to discharge and satisfy needs, repressive measures are taken and this results in immediate and spasmodic affective discharge without the delay inherent in smooth execution. Since colour is part of the emotional challenge presented by the environment, colour responses implying immediacy and passivity (because they are not guided by association to produce integrated FC responses) indicate that repression has taken place, and expression of affect is not smooth and goal-directed, but spasmodic impulsive and hairtrigger. As Rapaport says, "Thus affects are manometers and vents of the state of tension of instinctual needs from which they are derived."

The main impact of emotional stimuli derives from interpersonal situations, and the natural rider to the colour-emotionality hypothesis is that emotionality underlying colour responsiveness will be manifested especially in social context. Responsivity to interpersonal situations is a facet of social extraversion, and this in turn is mirrored by colour reactivity. In those groups characterised by high colour-response production, Rorschach includes hebephrenic schizophrenics, "...who are always ready to speak to whoever is about."

Therefore, the two hypotheses concerning colour responsivity may be stated as follows:

1. Colour reactivity is related to emotionality and impulsivity.
2. Colour reactivity is related to social extraversion.

## B. Form Responses

Form responses are those responses in which form has been the primary determinant. These include responses scored F, F+, and to some extent FC and Fc (see Glossary, Appendix F).

The problem confronting the perceiver before the production of a form response is one which demands an integration of formal elements into a communicable concept; the integration may often involve other elements of the blot.

An integrated concept, as represented by a form response, implies that the perceptual-associative process has operated fully. Conscious co-ordination of aspects of the blot and delay while associative processes are active, underpin a form response. According to Schachtel (1941) form perception involves "critical comparison between the form perceived and similar forms remembered." Rorschach states, "The subject searches among his visual memories for that one which in form, especially in



outline, most closely resembles the entire figure or one of its details." At one end of the spectrum form-responsiveness is, in Klopfer's terms, "a limited kind of perception" which is neither aware of the richness and contributive effect of colour, nor enriched by imaginal functions. At the other end form-responsiveness means a perceptual organization that depends on rich and variegated associative processes and critical assessment of the congruence of the concept with other aspects of the blot.

It would seem from Rorschach's observations that response to the formal qualities of a blot are symptomatic of a person's response to the formal qualities of the environment. In Rapaport's scheme, this means that affects, developed for the purpose of satisfying drives from which they derive, must be discharged smoothly to be most effective, and this is most advantageously achieved when there is some degree of reality testing before goal-directed behaviour is operant. A person's response to the formal qualities of the blot reflects his response to reality testing and affective discharge. If he takes formal qualities into account and produces a form-controlled response, he is testifying to his general ability to express affect smoothly and appropriately and to delay affective discharge. Form responses therefore imply lack of impulsivity and general emotionality. According to Rapaport "within the normal range, an increase in the F% refers to the presence of strong inhibition, while a decrease is referable more to the presence of impulsiveness."

The corollary to the form-control hypothesis is the converse to that of the colour-extraversion hypothesis. Since the chief affective impact in the environment is from a social context, form responsiveness implies an ability to withhold from emotional involvement and emotional reactivity in interpersonal relations. This implies a degree of social introversion.

Two hypotheses derive from Rorschach's theory concerning general form responsiveness:

1. Form responsiveness relates to non-impulsivity and emotional inhibition.
2. Form responsiveness relates to social introversion.

### C. Movement Responses

Responses under consideration here are M and m responses or human movement and inanimate movement. FM or movement attributed to animal figures will not be considered, as the interpretation is very different. From a purely perceptual point of view, the processes leading up to an FM response would seem to be similar to M and m but attribution of the same personality correlates is prohibited because of the content inherent in an FM response. This is supposed to imply some sort of regression to an infantile mode of perception, the rationale being that adults, if producing a movement response, should relate enough empathetically to their fellows to attribute human elements to the blot. Rationale concerning the m response has connotations similar to M, bar kinaesthesia, though it implies some feeling for conflict and tension beyond control.

Movement responses are the most complex responses in the colour, form, movement triad under consideration. For colour and form responses the problem confronting the perceiver is clear enough: the perceiver is to respond with a concept and to do so he must amalgamate the part of the blot which for him has most potency, with formal qualities. The kind of perceptual problem solved by a movement response is hard to define. Perhaps, as Rapaport (1946) and Arnheim (1966) maintain, it is a problem concerning an unbalanced configuration, so that change in some part would lead to better closure. This tendency of the perceptual system toward better closure in perceptual organization is emphasised by gestalt theories of perception. The apparent movement effect, or phi phenomenon, may be an example of this tendency to closure. Most certainly, Klein and Schlesinger's (1951) finding, that M production relates to ease of apparent movement, is in line with the view considering movement responses as a solution to perceptual imbalance. However, whatever the problem is, an M response squeezes the last ounce of perceptual articulation and concept generation from the perceiver at a point which delicately spans imagination and hallucination.

A movement response is an enrichment of a static configuration with projected dynamism. This perceptual process implies a rich store of associations and perceptual flexibility which crystallize in a movement response.

While reaction to colour mirrors responsivity to affectively charged stimuli, and reaction to form reflects responsiveness to the formal qualities and reality demands of the environment, a movement response is indicative of sensitivity to individual inner resources. The perception of movement in a blot implies the introduction of imagination and rich associative processes in precipitating the response. It would seem that this tendency to seek inner resources and imaginal functions when rendering a response to a perceptual configuration is symptomatic of such "introversive" tendencies in general behaviour. Movement responses, which are perceiver — rather than stimulus — determined, are therefore indicative of imagination, intelligence, creativity and other mental functions that the introversive side of the Rorschach "Erlebnistyp" imply. A preponderance of movement responses over colour, is characteristic, according to Rorschach, of "... people who are engaged in things of the spirit." Vernon (1933) says such people "live more in their thoughts and fantasies, and are less adapted to the outer world."

Though Rorschach theorists define the introversive tendencies that M responses represent in terms of creativity, imagination and intelligence, they are loath to extend the definition to include social introversion. Klopfer is even unwilling to link the terms extraversion-introversion with the Jungian construct, delay of action, even though the similarity would seem compelling. To resort to an exclusive Rorschach definition of these terms is patently absurd and nonproductive. To have a propensity to "engage in things of the spirit", as opposed to the outer world, would imply some degree of insulation from social contact. Rorschach calls this type of introversive tendency "intensive rapport", and says it typifies the individual "who has difficulty in making contacts but, once he has made them, shows

that he is able to get into close personal rapport.” Conversely, high C production implies “the urge to live in the world outside oneself.” Social introversion is therefore appended to the list of introversive tendencies and hypothesised in relation to movement reactivity.

The capacity to generate rich associative processes signifies, as it does with form responsiveness, a delay in perceptual processes in order to produce an elaborate and well co-ordinated response. This capacity for delay is mirrored in a more general setting, and the movement response is thus indicative of capacity for delay, non-impulsivity, and control.

In psychoanalytic terminology, movement responses indicate a high level of integration of cognitive functions, namely, the ego and archaic impulses. That the movement is largely perceiver-determined means that the ego is free to draw on the resources of the id, and enrich perception. This scheme for the description of movement responsiveness has two implications: movement responses involve imagination, intelligence and creativity, in that they draw on the resources of the id; this facility to draw on primitive impulses is a standby in periods of stress. The individual who can use inner imaginal resources freely can delay action and maintain stability.

The two hypotheses that result from this analysis are:

1. Movement responsiveness relates to emotional control and non-impulsivity.
2. Movement responsiveness relates to introversive tendencies — imagination, intelligence, creativity, and social introversion.

## **2. RORSCHACH STUDIES RELATING COLOUR, FORM AND MOVEMENT RESPONSES TO PERSONALITY FACTORS**

Klopfer (1954) embarks on his review of Rorschach validation studies with the view that single variables (or determinant counts) should not be extracted from a global context and tested against personality variables. His assumption is that one hypothesis can be tested at a time but one hypothesis involves interrelated determinant ratios. However, after reviewing work done with single determinant counts, he states, “The ‘single variable’ studies to date have been successful enough to contradict this assumption and demonstrate that it is feasible to test one hypothesis at a time.”

Eysenck (1970) condones the single variable method for different reasons. When the Rorschach test is used “in a psychometric manner,” he states, “results appear to be more positive and favourable. This will lead away from the promising but not very fruitful holistic approach of the traditionalists, to the more scientific and apparently more valid atomistic type of approach.”

The following is a review of studies relating colour, form and movement responses on Rorschach to hypothesised personality factors.

## A. Colour

Rorschach colour responses have been correlated with personality variables with a surprising amount of success. Studies will be divided into those concerned with the colour-emotionality hypothesis, and those concerned with the colour-extraversion hypotheses but it will be seen that the definition of these personality traits, and emotionality in particular, is far from unitary.

### Colour and Emotionality

Studies relating colour responsiveness to emotionality have conceived of emotionality in terms of irritability, neuroticism, open expression of affectivity, and impulsivity. A large body of work has derived from this hypothesis and results are fairly consistent, and confirmatory.

Oeser (1932) concluded that the group he tested on Rorschach who gave a large number of colour responses "could not be said to be abnormally irritable, impulsive or manic, nor to have excessively unstable emotions and affects."

But, he says, "provided we remember that the Cd (colour dominant on Rorschach) can be a perfectly normal personality type. . . it is true to say that this type is affectively less stable than the Fd, but this only means that their emotional side is less easily stimulated."

Oeser also delineates further characteristics of the Rorschach colour responder, and these include greater sensitivity, egocentric emotionality, and easily fitting into the environment.

Two studies concerning the Rorschach concept of colour shock are relevant here in so far as they show a relationship between emotional instability and colour response. The authors of the studies of hypothesise intervening phases in response to colour by unstable groups in terms of inhibition and blocking from colour impact.

Goldfarb's study is also pertinent, as he found inhibition and pathological emotional control to relate to colour responses.

Rockwell, Welch, Kubis and Fischelli (1947; quoted in Klopfer 1954) tested three groups. Two were student groups, one manifesting colour shock and the other showing no signs of colour shock. (The major sign of colour shock is that the time taken to respond to the coloured cards is longer than that to the black and white cards.) The third group comprised psychoneurotic patients who manifested colour shock.

Rorschach cards were projected on a screen for 90 seconds, and G.S.R. measured. The psychoneurotic group showed least change in G.S.R. for all cards. The non-colour shock group showed a change in G.S.R. for the first multi-coloured card, card VIII. This group also gave most responses to coloured cards; while the psychoneurotics gave fewest.

This result is interpreted as indicating that emotionality (as manifested by colour shock and psychoneurosis) leads to an inhibition of responsiveness to colour due to mobilisation of defence mechanisms.

*Wallen* (1948) abandoned standard procedure and asked each subject if he liked the Rorschach cards. The rationale was, that if subjects manifested colour shock, they would dislike the coloured cards.

He found that the men in his group who were about to be discharged from a military training station because of psychiatric unsuitability for service disliked the coloured cards. The "stable" group preferred the coloured cards.

The result is interpreted as support for Rorschach's contention that colour shock is "associative stupor". Colour produces a break in the associative processes and control mechanisms of unstable people so that it is found unpleasant.

*Goldfarb* (1943, quoted in *Klopfer* 1954) found that institutionalised children, as compared with a matched group of children in foster homes, showed a marked inability to form and maintain normal affectional relationships. They also gave a greater number of colour responses on the Rorschach.

In this case, inhibition of emotionality and incapacity for stability in emotional situations links colour responsiveness.

Two studies relate colour responsiveness to neuroticism: *Cox* (1951), in a factor analytic study, tested two groups of normal and neurotic children equated for age and intelligence. She found five factors. Among them was a neuroticism factor (the second factor) with its highest loading (.73) on the neurotic-normal dichotomy. Other loadings were CF and C responses.

*Eysenck* (1970) quotes a study by *Sen* (1950) which corroborates *Cox's* findings. *Sen* tested 100 Indian students on Rorschach, intelligence tests, and employed objective tests and ratings of neurotic tendency, extraversion, emotionality, and imagination. Three factors were extracted. The third was neuroticism with a correlation of .685 with ratings on neurotic traits. This factor showed high saturations on colour responses.

Two studies relate MMPI scales and items to colour responses on Rorschach:

*Clark* (1948) used the data amassed by *Altus* (1947) in testing 100 students on Rorschach and MMPI. He found that CF scores were associated with items on the MMPI indicative of impulsivity and lack of social conscience.

Sum C correlated with items indicative of hypomanic tendency and individualism. High sum C related to subjects saying the following items were not applicable to themselves:

"I have never done anything dangerous for the thrill of it",

"I feel it is certainly best to keep my mouth shut when I am in trouble".

*Adams, Cooper and Carrera* (1963) tested 36 hospitalised patients with functional psychiatric disorders. Colour responses on the Rorschach were found to correlate with the Hy scale of the MMPI. ( $r = +.35$   $p .05$ )

The Hy scale of the MMPI is indicative of egocentricity, immaturity, naivete, lack of insight, need of social approval, lack of inhibition, and sensitivity in response to affective stimuli; all of which

add up to a general picture of impulsive emotionality.

Ratings of impulsivity have been shown to relate to colour responsiveness in three studies:

*Benton* (1950) quotes an unpublished thesis by *Fitzgerald* in which high CF production as opposed to FC production was found to relate to pooled ratings of non socialized emotionality. The coefficient was .5, significant, though moderate.

*Gardner* (1951) had two measures of impulsivity: ratings by acquaintances, and impulsivity as indicated by the Rosenweig Picture-Frustration Test.

Predominance of colour responses as measured by the ratios  $C + CF : FC$  and  $C + CF : R$  were related significantly to both ratings of impulsivity. Impulsivity ratings by colleagues also correlated with a high proportion of  $FC + CF$  responses.

The correlations were as follows:

Ratings by acquaintances and colour ratios

|               |      |
|---------------|------|
| $C + CF : FC$ | .879 |
| $C + CF : R$  | .865 |
| $FC + CF : R$ | .788 |
| Sum C : Sum M | .788 |

Ratings from Rosenweig Picture-Frustration Test

|               |      |
|---------------|------|
| $C + CF : FC$ | .815 |
| $C + CF : R$  | .680 |

*Holtzman* (1950, quoted in *Keehn* 1953) found that ratings of impulsivity by other members of a group correlated significantly with colour responses.

Impulsivity, defined as inability to delay response in a test situation, also relates to colour responsiveness:

*Gill* (1966) tested subjects with 15 geometrical figures, asking them how they would appear in mirror image. Those who gave immediate answers gave a preponderance of colour responses on the Rorschach. Number of CF and C answers correlated with incapacity for delay at the .001 and .0003 levels respectively.

*Cerbus and Nichols* (1963) review the results of studies correlating colour responses and affectivity, from 1952. Studies on assaultive patients, epileptics, psychopaths and delinquents are summarised and they conclude that none of the studies of groups characterised by impulsivity found greater colour reactivity in these groups and some found even less.

Work with clinical groups would seem equally to offer no support from the colour-emotionality hypothesis. *Cerbus and Nichols* report that *Fisher* (1951) found that although pure colour responses were much higher than FC or CF responses in a group of hysterics their colour responsiveness was no different from a group of controls. They also report *Keehn's* finding (1955) that there was no difference



in the colour responsiveness of normal and neurotic groups. However they do mention a study by Wittenberg and Holzberg (1951) in which a significant difference was found for CF production between manics and depressives, manics giving more CF responses.

This review leads Cerbus and Nichols to conclude that only one result lends support to the colour-emotionality hypothesis, that of Gardner, in which impulsivity ratings were used.

Several points emerge from analysis of this review by Cerbus and Nichols.

Studies aligned to examine the colour reactivity-impulsivity hypothesis consist mainly of work involving criterion groups which should be characterised by greater impulsivity (assaultives, suicidals, epileptics). Even though Rorschach (1921) drew many of his conclusions from groups of epileptics and suchlike, there is no reason why each group should exhibit the same kind of impulsivity. A more modest conclusion in the light of these studies is that the colour-impulsivity hypothesis does not hold with extreme instances of overt impulsivity.

Cerbus and Nichols do report one significant finding from studies using criterion groups. (Holzberg 1951). Other studies have also used such groups and reported significant results; Adams, Cooper and Carrera (1963) used a group of hospitalised patients. Moreover, other studies reported in this section though not concerned with criterion groups, lead to a conclusion which is not as despondent as Cerbus and Nichols would uphold.

### Colour and Extraversion

Studies relating colour responsiveness on Rorschach to extraversion have been disappointing.

Two studies, done in the 1920s by Manz and Enke, show a relationship between colour responsiveness and cyclothymia, which lends some support to the hypothesised relationship of extraversion and colour responsiveness. Eysenck (1950) reports these two studies.

*Manz* (1930) tested 100 normals and found a greater proportion of colour answers among those of pyknic build. He also found a greater proportion of movement responses among leptosomatics. Correct agreement was found in 87% cases: the result was significant at  $p = .01$  level.

*Enke* (1927) found that 75% of pyknics were colour responders to 30% of athletics and 30% of leptosomatics. This result was also significant at  $p = .01$  level.

Much evidence has been amassed (Eysenck 1950) to show a correspondence between build and temperament. Kretchmer's theory links pyknic build and cyclothymia.

Social extraversion has been measured in various ways. Apart from Vernon's study (1933) work relating colour responsiveness to extraversion supports the hypothesis:

*Vernon* (1933) gave a questionnaire measure of extraversion to his subjects and obtained several other measures of "sociality" from tests and ratings. He found no correlation of these measures with colour predominance on the  $M = \sum C$  ratio.

*Keehn* (1953) reports an experiment by *Holtzman* (1950) in which extraversion in terms of shyness rated by friends correlated with colour responses.

*Thornton and Guilford* (1936) administered the Nebraska Inventory to a group of subjects. This inventory is based on Jungian typology and is scored on five scales: social introversion, emotionality, masculinity, rathymia, and thinking introversion.

The M : sum C ration showed no correlation with the Nebraska scales. No correlations were found for C or C% responses.

However, a biserial correlation between log M/C and certain items revealed that sum C preponderance related to items indicating like of forming new acquaintances, rarely liking to be alone, not trying to analyse oneself, rarely daydreaming, and liking people who play pranks.

The item correlations were almost significant, and are suggestive of a link between colour responses and extraversion.

*Cox* (1951), as reported above, tested two groups of normal and neurotic children. She found five factors. The fourth factor would seem to bear some relation to extraversion, and colour was among the loadings on this factor.

The conclusion suggested by this review of studies concerning hypotheses relating colour to emotionality is that results most certainly consistently support the hypothesis; a variety of criteria for emotionality have been used and findings are uniform.

Not many studies have concerned themselves with the colour-extraversion hypothesis, but from the few studies done there is enough concordance of results to imply a *prima facie* case for further investigations. Only *Vernon's* study contradicts the main trend.

#### Studies Relating Rorschach Colour Responses to Emotionality: Summary

| Study: Date:                       | Determinant:                          | Definition of Emotionality                          | Significance or Correlation (when reported) |
|------------------------------------|---------------------------------------|---|---|
| Oeser 1932                         | CF C                                  | Ratings by Oeser                                    |   |
| Rockwell, Kubis and Fischelli 1947 | Number of responses to coloured cards | Criterion group (psychoneurotics) G.S.R. Inhibition |   |
| Wallen 1948                        | Preference for coloured cards         | Criterion group (psychiatrically unfit)             |   |
| Goldfarb 1943                      | C                                     | Criterion groups (institutionalised children)       |   |
| Cox 1951                           | CF - C                                | Criterion group (neurotic children)                 |   |
| Sen 1950                           | C responses not specified             | Ratings on neurotic traits                          |   |
| Clark 1948                         | CF, sum C                             | MMPI items  |   |



| Study: Date:                      | Determinant     | Definition of Emotionality                                   | Significance or Correlation (when reported) |
|-----------------------------------|-----------------|--|---|
| Adams, Cooper and 1963<br>Carrera | C               | MMPI Hyscale   | .05   |
| Fitzgerald 1950                   | CF              | Ratings on non-socialised emotionality                       | $r = .5$                                    |
| Gardner 1951                      | CF, C, Sum C FC | Ratings by acquaintances<br>Ratings from RPFT on impulsivity | All rs above .6                             |
| Holtzman 1950                     | C               | Ratings by group members                                     |   |
| Gill 1966                         | CF, C           | Delay in problem solving                                     | .001  |

#### Studies Relating Rorschach Colour Responses to Extraversion: Summary

| Study: Date:                  | Determinant           | Definition of Extraversion                | Significance or Correlation (when reported) |
|-------------------------------|-----------------------|---|---|
| Manz 1930                     | Colour, not specified | Pyknic Build                              | .01   |
| Enke 1927                     | Colour, not specified | Pyknic Build                              | .01   |
| Holtzman 1950                 | C                     | Shyness Ratings                           |   |
| Thornton and 1936<br>Guilford | Sum C                 | Nebraska items                            |   |
| Cox 1951                      | Not specified         | Factor analysis                           |   |
| Vernon 1933                   | Sum C                 | Sociability<br>Ratings and Questionnaires | not significant                             |

#### B. Form

In relation to the form-responsiveness-control hypothesis, brief reiteration of those studies relating to colour reactivity on Rorschach and personality, and reported in that section, are pertinent here; some pitted colour reactivity (CF) against FC, and others related form to relevant variables in the same study. These studies regularly support the hypothesis.

As far as can be ascertained from current literature no studies have been done relating directly to the form-introversion hypothesis.

#### Form and Control

*Gardner* (1951) found that two measures of impulsivity related negatively to FC as opposed to CF

and C. Ratings by acquaintances on impulsivity correlated .879 with CF and C as opposed to FC. Ratings on impulsivity derived from the Rosenweig Picture Frustration Test gave a correlation of .815 with the same measure. This is evidence of a relationship between FC production and non-impulsivity.

*Benton* (1950) quotes *Fitzgerald's* finding that socialised expression of emotion related to FC as opposed to CF production. The pooled ratings of social adaptability and FC gave a correlation coefficient of .5.

*Clark* (1948) on analysing Rorschach protocols in relation to MMPI items found that subjects with an FC predominance in the  $FC : CF + C$  ratio were "more interested in the principle of the thing" and "tended to try to correct people who express an ignorant belief."

FC count related to items indicative of good adjustment, overcaution in social standards, deprecating self criticism and indecision. It also related to paucity of psychotic items.

Though both the  $FC : CF + C$  ratio and the FC count were unreliable, and hence only briefly considered, their relationship to items on the MMPI indicates that they mirror some sort of self-control over emotional expression and objectivity.

*Adams, Cooper and Carrera* (1963) found that F + related negatively to the Mf scale of the MMPI. This indicates that F + negatively correlates with items indicating proneness to worry, imaginative view of life, and unsatisfactory adjustment.

F + therefore correlates with stability, stereotype of thought, orderly and clear thinking and satisfactory adjustment.

*Gill* (1966) found that delay in answering a problem correlated with FC responses on Rorschach. The result was significant at the .01 level.

Various studies have related control under stress to form responsiveness.

*Williams* (1947, quoted in *Klopper* 1954) in a study involving experimentally induced stress, measured break in control by Digit Symbol Test performance decrement. FC responses correlated with control under stress at a level slightly below significance ( $r = .35$ ).

F + % responses correlated significantly with the criterion ( $r = .61$ ).

The multiple correlation of F + % and FC with control was .82 and *Klopper* concludes that this shows the FC count to be "far from negligible" in its relation to control.

It is the FC index which is most relevant to a consideration of form responsivity in general; F + % is an indication of form level. This study suggests that form responsivity as indicated by FC count is related to control under stress.

*Smith and George* (1951) administered the multiple choice group Rorschach developed by *Harrower* and *Erickson*. They also used decrement of performance in a digit symbol test as a measure of loss of control under experimentally induced stress: subjects were told they had done badly, and repeated the test. Difference between first and second performance was an index of performance decrement.

The coefficient of correlation for F% and decrement scores was .508 significant at the .01 level.

The relationship between F% and control was greater for F% ranging from 30 to 50. Control would seem to start relating negatively to F% at percentages over 50. But in general, the higher the F% the greater the ability to cope with stress.

*Baker and Harris* (1949, quoted in *Klopfer* 1954) found a correlation of .45 between control (as measured by intelligibility and co-ordination in speech) and FC predominance over CF.

F + % also related to control ( $r = .41$ ). No significances were calculated, but the result is in the predicted direction.

An unusual study by *Orlinsky* (1966) is partly relevant to the topic in hand; he showed that lack of dreaming related to form responses. This may imply that form responsiveness relates to a measure of "down to earthness".

F% was found to relate negatively to dream recall and dream time. The correlations were  $-.38$  and  $-.35$  respectively, both significant at  $P .01$ . *Orlinsky* tested the relationship of dreaming and F% because he considered F% an index of introspective constriction.

The relevance of this study to form hypotheses in general is dubious, but most certainly the result is in line with the hypothesis which relates reality testing to form production, if indeed dreaming has anything to do with fantasy production, introspection and limited reality testing.

In general the hypothesis that form production relates to control of emotionality and non-impulsivity has been well supported. Studies have used different measures of form production. Pure F production responses that are determined by form only, with no colour integration, as reflected by the F percentage count, have been shown to relate to control under stress. FC count has been shown to be related to control under stress, ratings of non-impulsivity and socialised emotional expression, items reflecting control and adjustment on the MMPI, and delay any problem solving. Studies involving F + % are partly relevant and follow the same general trend, though form level is not under direct consideration or specifically derived from the general hypothesis.

The lack of studies relating to Rorschach form responses and social introversion is unfortunate. The only indication that this hypothesis may be tenable comes indirectly from *Clark's* study (1948) which suggested FC predominance related to a facet of introversion as indicated by the items that discriminated. FC responses correlated with affirmation to interest in "the principle of the thing" and overcaution in social standards. This however hardly endorsed the hypothesis. It is to be hoped that this gap in experimentation can be filled by studies concerning form reactivity as measured by tests other than the Rorschach which have lent support to the hypothesis.

## Studies Relating Rorschach Form Responses to Control: Summary

| Study: Date                       | Determinant | Definition of Control                                 | Significances or Correlations (when reported) |
|-----------------------------------|-------------|---|---|
| Gardner 1951                      | FC          | Ratings by acquaintances and from RPFT                | .879<br>.815                                  |
| Fitzgerald 1950                   | FC          | Pooled ratings of social adaptability                 | .500  |
| Clark 1948                        | FC          | MMPI items  |   |
| Adams<br>Cooper & 1963<br>Carrera | F +         | Mf scale of MMPI                                      |   |
| Gill 1966                         | FC          | Delay in problem solving                              | .01   |
| Williams 1947                     | FC<br>F + % | Decrement of performance in Digit Symbol Test         | .35<br>.61<br>Mult.r. .82                     |
| Smith and George 1951             | F %         | " "   | .508 (.01)                                    |
| Baker and Harris 1949             | FC<br>F + % | Loss of word intelligibility and speech co-ordination | .45<br>.41                                    |
| Orlinsky 1966                     | F %         | Lower dream time<br>Lower dream recall                | -.38<br>-.35 .01                              |

**C. Movement**

Studies relating movement responses on Rorschach to personality factors will be divided into two sections. Studies relating to control comprise the first section. The second section involves studies relating movement responses to introversive tendencies. The latter covers a wide gamut of personality factors and has proved extremely difficult to define. Introversive tendencies in general imply introspection, intelligence, creativity and imagination, and social introversion. The list could be extended, for these terms are notoriously capable of overlap. Both hypotheses have received a fair amount of support.

**Movement and Control**

Control of emotional expression in relation to movement production has been studied in various ways. Every study provides support for the hypothesis, save that of Smith and George, when the result is in the predicted direction.

*Smith and George* (1951) failed to confirm the hypothesis that M predominance over FM related to control under experimentally induced stress. The correlation was .33, insignificant, but positive.

*Meltzoff and Litwin* (1956) played "The Jones Laughing Record" to a group of subjects, and noted

amount of compliance with instructions not to laugh with the record. Subjects were divided into high and low producers of M responses. High M production related to control: the chi-squared was 3.79, which was significant at the .03 level for a one tailed test.

*Levine and Meltzoff* (1956) administered a paired associate learning task to subjects and then had them respond to the stimulus words with words other than the associates. Success at this task was interpreted as effective cognitive inhibition of associations, and it correlated with high M production at the .01 level.

*Cocking, Dana and Dana* (1969) used a paired associate learning task in the same way as Levine and Meltzoff. They found a correlation between inhibition and M production which was significant at the .01 level.

*Gardner* (1951) found that M as opposed to C production was related to ratings by acquaintances of non impulsivity.

*Adams, Cooper and Carrera* (1963) found that M production related negatively to certain MMPI scales.

Si correlated — .57 with M responses significant at the .001 level. This scale reflects social uneasiness, insecurity, worries and self deprecation. The negative relation with M therefore implies that M production is associated with inner stability.

M production also related negatively to Hs, Hy, Sc, F and Si (with significances varying from .05 to .10). These scales are interpreted as indicating neurotic complaints, withdrawal, hostility, anxiety and intellectual confusion.<sup>x</sup>

M production correlated at the .10 level of significance with Es. This scale indicates physiological good health, stability, "a strong sense of reality", adequacy feelings, spontaneity and intelligence.

Inanimate movement responses (M) correlated positively with the Mf scale. Though this scale reflects some maladjustments, the authors interpret the correlation to mean M production is associated with imagination, higher educational attainment, and the capacity to anticipate conflicts.

*Levine Grassi and Gerson* (1943, quoted in Klopfer 1954) found that when it was suggested to subjects under hypnosis that they were tense, apprehensive, and hypochondriacal, they produced fewer M responses.

### **Movement and Introversive Tendencies**

In relation to the introversive hypothesis, various studies concerning intelligence, creativity, fantasy production, and social introversion are relevant. Intelligence has been measured by group tests and defined in terms of criterion groups. The first seven studies, with the exception of that of Vernon, all testify to a significant relation between intelligence and M production.

<sup>x</sup> The scales are listed (*Hathaway and McKinley 1943*) as meaning the following:

Hs: Hypochondriasis

Hy: Hysteria

Sc: Schizophrenia

F : Validity Score : Indication that the subject may have been careless or unable to comprehend items. "A low F score indicates the subject's responses were rational and relatively pertinent."

Si: Social Introversion

*Cocking Dana and Dana* (1968) outline six constructs to define the M response. According to them, M relates to accurate time estimate, ability to conceptualise interpersonal relations, fantasy, intelligence, creativity and motor inhibition.

They review work pertinent to each construct and conclude that there is evidence for a significant correlation of movement responsiveness with each variable.

*Levine, Spivack and Wight* (1959) used the Wechsler-Bellevue Intelligence scale to test hospitalised non-schizophrenic verterans, veteran patients in a psychiatric clinic, and emotionally disturbed adolescents. The correlations were .37, .49, .41, and .20 for each group's M production and intelligence; all correlations were significant at the .01 level.

These authors also review seventeen studies relating M production to intelligence. Their conclusion: "...it will be noted that there is a striking uniformity in the magnitude of correlations between M and intelligence. Across a variety of groups with differing measures of intelligence, the correlations are generally low, but significant, and with the exception of two studies (Altus and Thompson, 1949 and 1952) only linear relationships are reported." The median value for the M - IQ correlations they report at .26.

*Cocking, Dana and Dana* (1969) found that intelligence related to M production at a significance level of .05.

*Altus and Thompson* (1949) found that M responses correlated with a group intelligence test.

The M count had low reliability (test retest reliability) but it also correlated with intelligence, and may be valuable as an index of intelligence.

They quote Klopfer: "It is possible to evaluate a Rorschach record and to guess in the majority of cases within a range of 10 points what the intelligence of a subject in terms of a Binet IQ might be."

They conclude that M is a valid index of intelligence, though the converse is not necessarily true, high intelligence may not give rise to many M responses.

*Vernon* (1935) found a correlation of .78 between the Binet test and an estimate of intelligence based on a combination of Rorschach scores, including M. Vernon found that the separate components correlated poorly.

Three studies using criterion groups, reported by Vernon (1953), produce results in line with the movement responsivity - intelligence hypothesis. Goldfarb's study (1943) is also congruent.

*Vernon* (1933) reports a study by Munz (1924) in which 63 average subjects and 28 university professors were given Rorschach. The latter group produced a greater number and proportion of M responses, and the difference between the groups is probably significant.

Since M production increases with age, it could be that differences in M response were due to age differences. Vernon does not report whether Munz equated his groups for age and therefore the significance of this result must remain in doubt.



*Schneider* (1929, quoted in *Vernon* 1933) categorised children as most, and least, gifted. The superior group gave a higher proportion of F + %, O, and M responses, though the significance is dubious.

In his own study (1933) *Vernon* tested three groups varying in cultural and education attainment. There were considerable differences in total number of M responses, the superior groups producing more. M % showed no differentiation of groups, and *Vernon* concludes that differences were probably due to total number of responses produced.

*Goldfarb* (1943, quoted in *Klopfer*) found that a group of institutionalised children had impaired abstract functions, and differed considerably from a group of children in foster homes in performance and intelligence tests, concept formation tests, and speech ratings. They also produced significantly fewer M responses.

Creativity has been studied in a variety of ways. Studies of "creative groups" give contradictory results. *Lane's* study, using hypnosis, is an interesting mode of exploration and produces results in line with the hypothesis.

In a study which is too readily quoted and used as evidence against the M response — creativity hypothesis, *Anne Roe* (1946) found no significant difference in M production for a group of artists as compared with a group of non-artists. There were widespread individual differences in the group.

Attempts to reconcile this discrepancy of hypothesis and result involve translation of the M hypothesis into one relating M production to "creative personality" rather than creative output. *Klopfer* (1954) states, "The creativity indicated by M is a condition for creative output — a necessary but not sufficient condition." *Lane's* study (1948) would lend support to this interpretation, since he found that assumption of the creative role increased M responsiveness.

However, it is hard not to consider *Klopfer's* point as a *tertium quid*; contradictory results concerning the M creativity hypothesis are more likely the product of dissension as to the definition of creativity in terms of criterion groups. Other studies using groups of "creatives" have given positive support to the hypothesis.

*Hersh* (1962) used *Anne Roe's* data and research files on artists and compared their Rorschach protocols with those of salesmen, firemen and other non-artists. Artists showed a significantly higher M production; the result was significant at the .05 level. This surprising contradiction of *Roe's* result, when using the same data, may be because a different comparison group was used. A definition of "non-creativity" presents an even greater problem than definition of a "creative group".

*Bonifacio and Schaefer* (1969) tested 800 high school students on the *Franck Drawing Completion Tests*. Creative students in the fields of art and writing gave significantly more M responses. The result was significant at the .01 level. The trend was also for the creative students to give more FM and M responses.

*Rawls and Slack* (1968) tested groups of artists and non-artists on Rorschach. Artists gave a sig-

nificantly higher number of M, and M % responses.

*Dudek* (1968) measured creativity by TAT, drawings, and the Lowenfeld Mosaic Design. High M production correlated with creative output at a level of significance beyond .001.

*Lane* (1948, quoted in *Klopfer* 1954) hypnotised a group of subjects and suggested a mood of creative disposition and introversive tendencies. M production significantly increased when subjects were in this state.

Fantasy, though somewhat difficult to define and measure, has been shown to relate to M production in three studies.

*Orlinsky* (1966) found that M % and M production versus C production related to dream time and dream recall, at the .01 level of significance.

The relationship of dream recall and M production may imply that introspection, fantasy and associative facility is the common denominator.

*Kleinman and Higgins* (1966) interpret their finding, that females produce significantly more movement responses ( $p .025$ ), as evidence for the fantasy — M hypothesis. They intimate that differential sex role expectations involve the greater production of fantasy in females, since they are culturally more restricted, and inclined to adopt indoor, social and artistic pursuits.

*Bendick and Klopfer* (1964) found that after sensory deprivation subjects produced significantly more M, FM and m responses; a result significant at the .01 level.

They interpret the result in terms of sensory deprivation increasing the need for contact with the environment and this manifesting itself in projected movement.

Also congruent with this result would be the interpretation that sensory deprivation increases fantasy production and introspection, and that this excessive fantasy production is mirrored in M production.

Factor-analytic techniques, and correlation of movement responses with ratings and questionnaires, have shown a relationship between movement production and social introversion.

One early study linking schizothymia with M production also deserves mention.

*Manz* (1930, quoted in *Eysenck*, 1950) found a relation between M responses and leptosomia; C responses and pyknic build. Correct psychosomatic agreement was attained in 87% of cases, a result significant at the  $P .01$  level.

*Thornton and Guilford* (1936) found that preponderance of M responses over C responses correlated with certain items on the Nebraska Inventory. These items indicate that subjects with high M production consider themselves tense and highly strung, dislike forming new acquaintances, seek to be alone sometimes, often try to analyse themselves, daydream frequently, and dislike people who play pranks.

This result must be interpreted cautiously. Only 20 subject were tested in this study, and no



relationship was found between the  $M : \text{Sum } C$  ratio and the Nebraska scales. Also these findings were not substantiated by 58 subjects tested later. In this second study, only the item indicating that subjects considered themselves tense and highly strung correlated with  $M$  responses.

Thompson (1948) found that Rorschach  $M$  responses in small details related significantly to several items on the MMPI, though, like Thornton and Guilford, she found no relation to any scale per se. The following items were endorsed positively a significant number of times by subjects with high  $M$  productivity:

"Even when I am with people, I feel lonely much of the time."

"At parties, I am more likely to sit by myself or with just one other person than to join with the crowd."

"I sometimes find it hard to stick up for my rights."

"I am often afraid that I am going to blush."

"I have often been frightened in the middle of the night."

"I dream frequently."

The following items were negated as applicable by subjects with high  $M$  production:

"I enjoy the excitement of a crowd."

"I am often so annoyed when someone tries to get ahead of me in a line of people that I speak to him about it."

Thompson concludes that the rubrics most evident for these items are social introversion, submission, passivity and anxiety.

In scoring the Behn-Rorschach Ink Blots, Zulliger (1956) distinguishes between human movement responses and movement seen in small details; these are scored  $M$  and  $m$  respectively. Klopfer (1954) denotes inanimate movement by  $m$ ; this is quite different from Zulliger's score  $m$ , which is determined by the size of the blot area responded to.

It is significant that Zulliger suggests that the implications of  $m$  are very different from those of  $M$ :  $m$  indicates propensity for elaboration and decoration; rather pleasure in telling fantasies than the propensity for creative fantasy itself. It would seem that Zulliger does not hypothesise that  $m$  relates to introversive tendencies, at least in so far as they are reflected by creative fantasy.

The relevance of Thompson's finding is therefore dubious, since distinction has been made between movement seen in small details and  $M$  responses. Zulliger does say, "As a rule, subjects producing  $ms$  also give  $Ms$  . . .", but qualifies this by, ". . . yet there are also persons who see  $ms$  but not  $Ms$ ."

The judgement on Thompson's finding must be that in so far as movement in small details relates to  $M$ , there is support here for the hypothesis that  $M$  relates to social introversion, even though Zulliger treats them separately and does not hypothesise  $m$  in relation to introversive tendencies in general, which would include social introversion.

Holtzman (1950, quoted in Keehn 1953) identified the  $M : \text{Sum } C$  ratio with ratings of shyness -

gregariousness by friends. M responses related to social introversion.

Eysenck (1956) tested 13 males and 13 female identical twins, and 13 female and 13 male fraternal twins, in an attempt to demonstrate the hereditary basis of extraversion - introversion. He found two factors: the first intelligence, the second extraversion. M % had the highest saturation on introversion ( - .626) and FM preponderance over M had the next highest saturation on extraversion ( + .501). The other two indices that showed saturations on this factor were a sociometric assessment of social popularity and social liking ( + .632 + .574 respectively).

Much support has been gleaned from the studies reviewed for the hypothesis linking movement responses and control. Introversive tendencies including intelligence, creativity, fantasy and social introversion have also been shown to relate to M production.

Studies Relating Rorschach Movement Responses to Control: Summary

| Study: Date              | Determinant: | Definition of Control                                      | Significance or Correlation (when reported) |
|--------------------------|--------------|--|---|
| Smith and George 1951    | M            | Decrement in performance on Digit Symbol Test              | .33   |
| Meltzoff and Litwin 1956 | M            | Experimental instructions to control affect                | .03   |
| Levine and Meltzoff 1956 | M            | Paired associate learning: inhibition of learned associate | .01   |
| Gardner 1951             | M            | Ratings by acquaintances on non-impulsivity                |   |
| Adams Cooper and 1963    | M            | MMPI scales  | .001  |
| Carrera                  | m            |  |   |
| Levine Grassi and 1943   | M            | Hypnotic suggestion  |   |
| Gerson                   |              |  |   |
| Cocking Dana and 1969    | M            | Paired associate learning: inhibition of associates        | .10   |
| Dana                     |              |  |   |

Studies Relating Rorschach Movement Responses to Introversive Tendencies: Summary

| INTELLIGENCE            |                       |                            |   |
|-------------------------|-----------------------|----------------------------|---|
| Study: Date:            | Determinant           | Definition of Intelligence | Significance or Correlation (when reported) |
| Cocking 1969            | M                     | not specified              | .05   |
| Dana and Dana           |                       |                            |   |
| Levine Spivack and 1959 | M                     | WB                         | .01   |
| Wight                   |                       |                            |   |
| Altus and 1949          | M                     | Group intelligence Test    |   |
| Thompson                |                       |                            |   |
| Vernon 1935             | Composite including M | Sinet                      | .78   |

| Study: Date:   | Determinant | Definition of Intelligence                  | Significance or Correlation (when reported) |
|----------------|-------------|---|---|
| Munz 1924      | M           | Criterion group: university professors      |   |
| Schneider 1929 | M           | Criterion group: "gifted" children          |   |
| Vernon 1933    | M           | Criterion group: "cultured"                 |   |
| Goldfarb 1943  | M           | Criterion group: institutionalised children |   |

## CREATIVITY

| Study: Date:                   | Determinant | Definition of Creativity         | Significance or Correlation (when reported) |
|--------------------------------|-------------|----------------------------------|---|
| Roe 1946                       | M           | Criterion group: artists         | not significant                             |
| Hersh 1962                     | M           | "                                | .05   |
| Bonifacio and 1969<br>Schaefer | M<br>FM, m  | FDCT                             |   |
| Rawls 1968<br>and Slack        | M%<br>M     | Criterion group: artists         | .001  |
| Dudek 1968                     | M           | TAT Drawings<br>Lowenfeld Mosaic |   |
| Lane 1948                      | M           | Hypnotic suggestion              |   |

## FANTASY

| Study: Date:                 | Determinant  | Definition of Fantasy      | Significance |
|------------------------------|--------------|----------------------------|--------------|
| Orlinsky 1966                | M<br>M %     | Dream Time<br>Dream Recall | .01          |
| Kleinman 1966<br>and Higgins | M            | Females                    | .025         |
| Bendick 1964<br>and Klopfer  | M<br>FM<br>m | Sensory<br>Deprivation     | .01          |

## SOCIAL INTROVERSION

| Study: Date:                  | Determinant | Definition of Social Introversion | Significance or Correlation     |
|-------------------------------|-------------|-----------------------------------|---------------------------------|
| Manz 1930                     | M           | Leptosomia                        | .01                             |
| Thornton 1936<br>and Guilford | M           | Nebraska Inventory                |                                 |
| Thompson 1948                 | M           | MMPI items                        |                                 |
| Holtzman 1950                 | M           | Ratings by friends                |                                 |
| Eysenck 1956                  | M %         | Ratings                           | Loading on introversion<br>.626 |

### 3. STUDIES RELATING COLOUR, FORM AND MOVEMENT RESPONSES IN SPECIFIC TESTS TO PERSONALITY FACTORS

Various tests, some of which are described below (Chapter 4), have been developed to measure colour-form reactivity without using the Rorschach Ink Blot Test. Parallel sets of ink blots have also been developed to measure movement responses independently of Rorschach.

The Rorschach hypotheses relating each type of response to personality variables have been delineated above, and this section is an attempt to review the support they gained from experiments done with tests other than Rorschach. In order to clarify that the colour-form responsiveness discussed in this section is not measured by Rorschach the terms colour dominance and form dominance will be used and this also is a reminder that often the subjects in these experiments are classified dichotomously, as either colour or form dominant, rather than more or less colour or form responsive. The term "movement threshold" is one which is used by the research workers who have devised ink blots specifically to study the movement response and this will be used for movement responses to stimuli other than Rorschach ink blots.

#### A. Studies Relating Colour and Form Dominance to Personality Variables

Tests used in the studies reported in this section and devised to measure colour and form dominance do so in terms of colour versus form dominance so that both colour and form dominance are measured in the same study. Single experiments carried out with Rorschach have often studied either colour or form. Since the hypotheses concerning colour in relation to personality variables are the converse of hypotheses relating form to personality, the studies in this section will treat colour and form dominance together.

If the hypotheses of colour and form reactivity in relation to emotionality and control have received support at the expense of the colour-extraversion, form-introversion hypotheses in studies using the Rorschach test, work with other tests has redressed the balance and amassed support for the extraversion hypothesis while the emotionality-control hypotheses have received little attention.

#### Colour-Form Dominance and Emotionality

Not much work has derived from the hypothesis relating colour-form dominance to emotionality.

*Keehn* (1953) using a variety of colour-form dominance tests (some described in Chapter 4, Section 2) reports contradictory results for himself and *Eysenck*. The latter reports a group of neurotics to be more colour-dominant than controls. *Keehn* failed to replicate this finding. As noted above, in relation to the review by *Cerbus* and *Nichols*, work with clinical groups has proved disappointing.

The Pyramid Test, developed by *Schaie* (1966) can be regarded as a test of colour dominance to some extent. He found that some subjects, when arranging coloured squares in a pyramid shape did so without regard to structure, while others arranged colour closely in accordance with structural aspects

of the pyramid surface. Schaie found that the former (colour dominants) were "emotionally labile and unstable", the latter, "severely inhibited and constricted."

*Granger* (1953) used the Schmidt test (described below) and found it had a negative saturation with a speed of perception factor ( $-.29$ ). The larger the score on the Schmidt test, the greater the form dominance. This result, therefore, shows that colour dominance is correlated with a quick reaction time, which suggests a colour dominance and impulsivity link.

### Colour-Form Dominance and Extraversion

The majority of work concerning colour-form dominance and extraversion-introversion was done in the twenties and thirties. Eysenck (1950) and Keehn (1953) give inclusive reviews of this work. On the whole, the relationship most thoroughly attested in this field is that of cyclothymia-schizothymia and colour-form dominance. *Prima facie*, this work must testify to the connection of extraversion, loosely defined, and colour-form dominance. Eysenck (1940) gives some support to the hypothesis specifically relating social extraversion to colour dominance.

Kretchmer regarded his cyclothymia and schizothymia types as diluted forms of manic depression and schizophrenia. These all form a continuous dimension. Cyclothyms are therefore characterised by mood swings which span overactive and excitable manic tendencies, and inactive, lethargic depression. Schizothymes tend to lack affect and emotional responsiveness, and to withdraw from normal interpersonal relations.

There would seem to be a correspondence here between Kretchmer's typology and the concept of social extraversion and impulsivity, even though Eysenck (1950) has stated that his dimensions — neuroticism and extraversion — bear no relation to Kretchmerian types.

Bearing in mind that the following workers usually tested only a small sample of subjects, used different statistical procedures, and often do not report significances, the results they derive show remarkable consistency. There is no doubt that some relationship exists between colour-form dominance and Kretchmer's dimension of cyclothymia-schizothymia.

*Scholl* (1927, 1928, quoted in Eysenck 1950, Vernon 1933) had 30 subjects pick out a figure from similar groups of figures after tachistoscopic exposure. Identification could be by colour or form, and subjects were classified as colour-or form-dominant in four degrees C, CF, FC, and F. A questionnaire was used to classify subjects as more or less cyclothymsic-schizothymic, on a four-point scale. The results indicate a definite tendency for schizothymes to be form-dominant and cyclothyms-colour dominant. Vernon (1933) calculated a fourfold correlation of .91, and independently Eysenck states that the difference between groups was significant at the .01 level.

*Dambach* (1929, quoted in Eysenck 1950) used Scholl's method and found cyclothymsic children to be more colour-reactive; schizothymic children more form-reactive.

*Enke* (1928, quoted in *Eysenck* 1950) tested 184 subjects, using a test which involved tachistoscopic presentation of different groups of nonsense syllables. Subjects on first presentation were to note position and colour and on second, to note the letters. The score was excess colour to letter answers. Subjects were divided into pyknic, athletic and leptosomatic types, and the average score was 10.2, .8, and 1.4 respectively for the groups. Incidence of colour dominance among pyknics as opposed to the other two groups was significant at the  $p = .01$  level.

Further studies reviewed by *Eysenck* and *Vernon* lend unequivocal support to the colour-form dominance cyclothymic-schizothymic link, (e.g. *Lutz* 1929, *Ritter* 1930, *Poppinga* 1931, *Braat* 1936, *Luth* 1936, *Lindberg* 1938).

Regardless of empirical evidence to the contrary (*Eysenck* 1947) there is a case for regarding cyclothymia-schizothymia as overlapping extraversion-introversion conceptually, and evidence from studies concerned with cyclothymia-schizothymia must lend support to an extraversion-introversion, colour-form dominance link.

Among the few studies involved directly with extraversion-introversion, defined more in Jungian terms, and colour-form dominance, there is again agreement of results.

*Schmidt* (1936) developed an extremely ingenious device for differentiating colour and form dominance, based on an apparent movement effect. Coloured spots and lines are projected on a screen in such a manner that apparent movement is seen in two directions. If a subject sees movement in one direction he is following fixed colour and flickering shape; in the other direction fixed shape and flickering colour. Depending on the direction of apparent movement, subjects are categorised as colour-or form-dominant. *Schmidt* assessed degree of extraversion and introversion himself. The number of extraverts who were colour-dominant far exceeded the number of extraverts who were form-dominant, and introverts who were colour-dominant. *Schmidt* used no tests of significance, but found correct typological agreement in 44 cases out of 54.

*Eysenck* (1940) used 10 differently shaped polygons and 10 colours and had subjects rank them in order of preference. From every possible combination of polygon and colour, the least-preferred polygon and the most-preferred shape, and so on for second preferences. These were ranked again by the subject and the ranking from this correlated with the first two rankings. The higher correlation gives an indication of colour-form dominance.

*Eysenck* found a correlation of .472 between colour dominance and extraversion, as measured by questionnaire. The correlation was almost significant.

*McElroy* (1953) used a test similar to *Eysenck's* in music. He had subjects rank tones and rhythms, and assessed tone-rhythm dominance. This he considered analogous to colour-form dominance. No correlation between tone-rhythm dominance and extraversion-introversion was found. The correlation between colour dominance and tone dominance was partly significant, which is some justification of



McElroy's analogue. The trend was towards colour-form dominance correlating with extraversion-introversion as measured by Heidbredder's test. McElroy concludes that the latter relationship has more validity than the tone-extraversion link; "...tests of colour-form attitudes provide results which appear logically to have more reality in relation to actual visual perceptions than do the results of the present test in relation to listening to music."

McElroy's conclusion is interesting and the analogy most certainly should be pursued. It is significant that the highest correlation was between colour dominance and tone dominance; the relationship is relevant to any study seeking to establish a general colour reactivity dimension.

One result bearing on this discussion, concerning the use of clinical groups, must be mentioned here, as it has given rise to controversy and misunderstanding.

*Keehn* (1953) tested three groups: neurotics, normals and schizophrenics. He reports that the schizophrenic groups was the only one differentiated by the colour-form tests, and it was significantly more colour-dominant.

This has often (e.g. *Cerbus and Nichols*, 1963) been interpreted as evidence against the hypothesis that introversion is related to form dominance. The premise of this argument is that schizophrenia is an extreme state of introversion, normality and abnormality being on a continuum; therefore evidence suggesting colour dominance in schizophrenics damages the colour-form dominance-extraversion-introversion hypothesis.

This argument loses ground when the premise, that schizophrenia is an extreme state of introversion, is weakened. *Eysenck* (1952) using his method of "criterion analysis" showed that the hypothesized continuum ranging from manic depression through cyclothymia-schizothymia to schizophrenia was not tenable, in the light of results which showed that a large battery of tests discriminating between manic depressives and schizophrenics did not correlate for the normal and psychotic groups separately.

Another important point is that *Rorschach* theory does not state that schizophrenics should produce fewer colour responses. *Rapaport* (1946), regarding the diagnostic significance of colour, states that in his experience, colour responses are most prevalent among unclassified schizophrenics. Paranoid and simple schizophrenics usually produce few colour responses.

Most probably *Keehn's* group of schizophrenics were unclassified, and therefore his result is not surprising. This only highlights the need to define clearly the characteristics of nosological groups in studies of this type.

*Keehn's* result, therefore, in no way invalidates the extraversion-introversion-colour-form hypothesis.

The work concerning colour-form dominance has lent support to the two main hypotheses.

Emotionality as defined by *Schaeie* would seem to relate to colour-form dominance as indicated by the pyramid test; *Eysenck* and *Keehn* have obtained results in contradiction to one another when testing groups of neurotics. The status of the emotionality hypothesis regarding colour-form dominance



is in doubt.

Cyclothymia-schizothymia would seem to relate to colour-form dominance. Results suggest a relation between extraversion-introversion and colour-form dominance though results are far from conclusive.

## B. Studies Relating Movement Threshold to Personality Variables

Three studies bearing on the hypothesis relating ease of perception of movement in ambiguous stimuli to personality variables are relevant here. They concern perception of movement out of a Rorschach context by means of sets of ink blots specifically designed for the measurement of movement responsiveness.

The first study produces a result which negates one hypothesis relating to movement threshold — that of creativity. The second obtains contradictory results. As already reported, the movement-creativity studies are equally damaging to this hypothesis in experiments using Rorschach ink blots.

The third study is more general and supports several hypotheses concerning movement production.

*Rust* (1948) used the *Levy* ink blots (1942) to test 88 schoolchildren. Movement responses correlated negatively with creativity ratings by art teachers on definitive criteria (e.g. sensitivity for drawing a line, feeling for "space" cutting, and colour harmony). The correlation was  $-.27$  significant at the .01 level.

*Richter and Winter* (1966) found results which do not agree with *Rust's*. They tested 15 female undergraduates on the *Holtzman* ink blots (1961) and the *Myers-Briggs* type indicator (1962). Scores on the intuitive and perceptual scales correlated positively with M responses at the .0005 level of significance. This finding is interpreted as substantiation for the creativity-movement responsiveness hypothesis.

*Barron* (1955) developed a series of ink blots which were arranged in order of propensity to elicit a movement response, graded, after testing a large sample, in terms of response threshold index.

Introversion was gauged by questionnaire, adjective check list, and 76 statements sorted on a nine-point scale of applicability.

The objective tests produced no significant correlations.

Subjects with a low movement threshold were significantly differentiated from those with a high movement threshold by the following items on the adjective check list which were considered applicable to the low movement threshold group: fairminded, mild, anxious, mannerly, inventive, interests wide; versus practical, stubborn, simple, masculine, and arrogant.

Composite Q sort descriptions yielded the following items which differentiated between the high and low movement threshold groups at the .05 level of significance. Low threshold was related to

1. Highly cathects intellectual activity.

2. Socially appropriate behaviour, gets along well.
3. Introspective, frequently self aware.
4. High intelligence.

High threshold related to:

1. Narrow range of interests.
2. Allows personal spite, bias and dogmatism to enter judgements.
3. Prefers action to contemplation.
4. Rigid, inflexible in action.

It would seem that all hypotheses put forward concerning movement responsivity are confirmed here to some extent. Non-impulsivity and control would seem to link low movement threshold. Introverted tendencies — intelligence, creativity, introspection and introversion — also relate to low movement threshold.

The hypothesis relating movement responses to control receives some support from Barron's study. Low M threshold relates to "socially approved" behaviour ratings.

The creativity aspect of the introverted hypothesis is not supported by Rust's study. Barron, however, has shown that low movement threshold correlates with assessment of high intellectual capacity by observers. His objective test of intelligence did not discriminate high and low threshold groups. His results are opposed to those of Rust in that his low threshold group was considered by raters as more inventive. Some support would also seem to be amassed for the relationship of introspection and M production. The two groups were distinguished by the statements: "introspective, frequently self aware", and "prefers action to contemplation".

No definite conclusion can be drawn from the above studies, save that there is an indication that stability and intelligence link low movement threshold.

#### Studies Relating Colour-Form Dominance to Emotionality-Control: Summary

| Study: Date  | Test         | Definition of Emotionality | Significance    |
|--------------|--------------|----------------------------|-----------------|
| Eysenck 1940 | Polygon Test | Criterion group: neurotics | trend           |
| Keehn 1953   | Various      | Criterion group: neurotics | not significant |
| Schaie 1966  | Pyramid Test | Description by observation | trend           |
| Granger 1953 | Schmidt Test | Reaction time              |                 |

Studies Relating Colour-Form Dominance to Extraversion-Introversion:  
Summary

| Study: Date:     | Test          | Definition of Extraversion | Significance |
|------------------|---------------|----------------------------|--------------|
| Scholl 1927,1928 | Tachistoscope | Questionnaire cyclothymia  | .01          |
| Dambach 1929     | "             | Not reported               | trend        |
| Enke 1928        | "             | Pyknic build               | .01          |
| Schmidt 1936     | Film          | Observation                |              |
| Eysenck 1940     | Polygon Test  | Questionnaire              | .472         |
| McElroy 1953     | "             | Heidbredder's Inventory    | trend        |

Studies Relating Movement Threshold to Control, and Introversive Tendencies:  
Summary

| Study: Date:            | Test     | Definition of Variable Studies  | Significance                 |
|-------------------------|----------|---|------------------------------|
| Rust 1948               | Levy     | Creativity Ratings by teachers  | Opposed to hypothesis<br>.01 |
| Richter 1966 and Winter | Holtzman | MBTI Creativity   | .0005                        |
| Barron 1955             | Barron   | Adjective check list & statements assessing 'socially appropriate behaviour' and introversive tendencies<br>creativity, intelligence<br>social introversion | .05                          |

#### 4. STUDIES RELATING TO PAINTING, COLOUR REACTIVITY AND PERSONALITY

Hypotheses relating colour, form and movement production to personality have been reviewed.

There is a general consistency in results which show that colour, form and movement reactivity as measured by Rorschach, and independent colour-form dominance and movement threshold tests, relates fairly reliably to hypothesised personality factors.

Research concerning the relation of colour responses in painting shows a similar consistency. The variable studied is emotionality, and it would seem to correlate with use of colour in painting. This result is promising and leads to speculation concerning the relationship of other determinants to personality factors, in this context.

*Alschuler and Hattwick* (1947) in a comprehensive study of the painting of children, observed that colour was used to a greater extent by impulsive children.

*Cerbus and Nichols* (1963) found that preference for colour in pictures correlated with the Hypochondria scale and the Hysteria scale of the MMPI.

Not much confidence is placed in their discovery, since they state that from 63 correlations these two were the only significant ones and three would be expected by chance.

Colour preference as opposed to preference for tint and shade has also been shown to correlate with emotionality.

*Barrett and Eaton* (1946) report a study in which subjects were divided into groups preferring colour or tints.

Those who preferred colour had higher annoyance scores on the personal audit inventory (see *Adams*, 1941), indicating irritability towards the environment. They also had lower morale scores on the MMPI. They made larger estimates of a number of dots and this is interpreted to mean impulsivity and liveliness. On a questionnaire they reported that their emotions were more easily recognised by their friends.

##### 5. TEST INTERCORRELATIONS: STUDIES CONCERNING THE RELATION OF RORSCHACH DETERMINANTS TO COLOUR-FORM DOMINANCE AND MOVEMENT THRESHOLD

It is a feasible question to ask whether tests of colour-form dominance are measuring the same colour reactivity as the Rorschach. Studies which have set out to measure this question present equivocal results. Early work by *Oeser* (1932) and *Schwarz* (1941) indicate that colour dominance and Rorschach responses do correlate, though the significance of their results is dubious. Work using factor analytic techniques, (*Thurstone*, 1944, and *Keehn*, 1953) represent conflicting results. Though it would seem from *Keehn's* work that tests of colour-form dominance are measuring the same dimension, Rorschach colour and form responses would seem independent of this.

No study has been carried out on the relation of M threshold ink blots to each other, and to Rorschach movement responsiveness. It would seem that since these tests were devised as ambiguous stimuli and graded for the express purpose of eliciting movement responses, that there is a *prima facie* case for accepting their interrelationship. Judgement must still be suspended, however, until evidence is forthcoming.

Before considering the relationship of Rorschach to colour, form and movement responsiveness as measured by other tests, the relationship of different colour-form dominance tests to one another must be considered. It is essential that colour-form tests measure a common dimension or else any correlation a colour-form test has with an outside variable must occur for some reason other than colour-form responsiveness.

*Keehn* (1955) quotes *Eysenck's* study in which it was found that three tests of colour-form dominance gave a low insignificant correlation (.24). Either, he concludes, they measure specific abilities, or the tests used were poor measures of a general ability that does run through the tests.

*Keehn's* own study (1953) involved a large battery of colour-form tests and the factor analysis revealed two factors, one of which was a colour-form factor. He concludes that there is a definite colour-form dimension, that experiments done on colour-form responsiveness are comparable, and that it is plausible to correlate colour-form reactivity with external personality variables.

Two early studies found a relationship between colour reactivity on Rorschach and colour-form dominance tests which latter work has failed to substantiate.

*Oeser* (1932) administered a tachistoscopic test of colour-form dominance. This consisted of a

coloured shape viewed first, then a ring of coloured shapes including the original shape in a different colour, and the original colour in a different shape. Depending on which was identified as the original coloured shape, subjects were classified as colour-dominant or form-dominant. He found that in general colour dominants were also colour-responsive on Rorschach. Subjects had been classified as colour-form reactive on Rorschach in four degrees: C, CF, FC, F. There was a gradual increase in "the effectiveness of form between the two extremes."

Oeser interprets his results as showing a continuum of colour-form dominance extending from lower levels, physiological and perceptual (as revealed in a tachistoscopic test), to the analysis of more complex sense data, like Rorschach ink blots. At even "higher conscious levels" Oeser says, colour dominance is revealed by attitude; greater "interest" in colour.

Oeser reports his results in table form without the application of correlation or significance. Vernon concludes regarding his findings, "...a table such as this often gives a spurious notion of the degree of correspondence; I doubt if it represents a correlation higher than .33." The significance of Oeser's result must therefore remain in doubt.

*Schwarz* (1941, quoted in *Keehn* 1953) found that colour dominants on *Lindberg's* test were colour-dominant on Rorschach. Again, no significances were reported.

In a factor analysis of a sizeable test battery, *Thurstone* (1944) found that Rorschach scores of colour did not relate to any other tests of colour dominance, notably the Stroop Test, Schmidt's Test, Colour-Form Memory, and sorting.

*Keehn* (1953) found two factors on analysing a large battery of tests including Rorschach. The first factor was a colour-form factor, the second a whole-part factor.

The Rorschach colour score was related to the second factor. Its saturation was .6 on the whole-part factor.

*Keehn* concludes that colour responsiveness to Rorschach has little to do with the response to colour in colour-form dominance tests. *Keehn* believes that the relationship of colour attitude and synthetic attitude may be the passivity in response to both. The interpretation of colour responses — as reflecting passivity, impulsivity and other attitudes — may be correct, but the rationale, concerning what the subject is responding to, would seem wrong.

The conclusion drawn from these studies must be that at present there is no evidence indicating an unqualified connection between colour form and movement responsivity on the Rorschach, and other tests. It is a moot point whether there is a uniform dimension underlying colour, form and movement responses.

## 6. STUDIES EXTENDING COLOUR, FORM AND MOVEMENT RESPONSIVENESS TO OTHER CONTEXTS

The work to be described in this section involves testing the general hypothesis that colour, form

and movement responsiveness involve dispositions which are uniformly manifest in many contexts.

Though it remains to be seen whether colour-form dominance and movement threshold relate to Rorschach measures of these tendencies, work reported in this section suggests that colour responsivity on Rorschach related to use of colour in paintings and Koh's Blocks. Also that movement responses on Rorschach relate to ease of perceived motion.

These studies mark an important bridge between Rorschach colour form and movement responsiveness and general reactivity in wider contexts.

Work relating tests other than Rorschach, like colour-form dominance and movement threshold to other situations would provide valuable information concerning perceptual style in general. Nothing has been provided on these lines as yet.

*Sarason and Potter* (1947, quoted in Klopfer 1954) tested groups of children with Koh's Block Designs, which involve colour and are used to assess intelligence. Those children who performed poorly on Koh's blocks gave more colour responses on Rorschach; they were the only ones to give Cn, C des, and FC — responses, and had lower form level for colour cards. Those children who performed well on Koh's Blocks, 5 out of 7 passing the 17th design, gave fewer colour responses, and only one minus form level response to the colour cards.

The authors conclude that emotional reactions, interfering with intellectual functioning, are associated with colour on both Rorschach and Koh's test. The impairment of performance on Koh's test is either due to the direct effect of colour, or the difficulty in obtaining visual grasp of figure-ground relationships when colour is introduced.

Dorken (1953) judged from colours used in finger painting that the use of many bright colours related to colour responsiveness on Rorschach.

*Ruesch and Fensinger* (1941, quoted in Klopfer 1954) found that subjects with many colour responses on the Rorschach chose many colours in drawings and spread them liberally over the whole paper. Those with few colour responses on Rorschach tended to use only one colour, and this to mark outline.

*Cook* (1967) found evidence suggesting that preference for a colour led to the use of that colour in determining responses on the Rorschach, especially CF and C responses.

She also found that both most — and least — preferred colours drew good form level ratings for responses.

Movement responsivity has been found to relate to other perceptual situations. Klein and Schlesinger relate it to the Phi phenomenon, and Ward (1966) on reviewing the literature, concludes that M responses relate to overt behaviour.

*Klein and Schlesinger* (1951) investigated the hypothesis that Rorschach responses reveal ego processes that are no different from those appearing in other, quite different situations. They found that



"Form Bound" subjects — that is, subjects who had high F + % and a large number of F responses, versus those who had low F and high F —, had the greatest difficulty in perception of apparent movement. The difference between the groups was significant at the .001 level.

Those subjects who manifested most ease of apparent movement perception produced more CF, bizarre and M responses, though M % did not relate, and this may imply that productivity was the important factor in relation to phi.

These results are interpreted as indicating that apparent movement, "form lability" (as opposed to form boundedness) and movement responsivity on Rorschach mirror readiness to accept a compromise solution to a task in visual organisation.

## 7. CONCLUSION AND SUMMARY

The alliance of perceptual style and personality factors would seem to be fairly well attested by results. Rorschach colour, form and movement responses relate consistently to personality traits hypothesised.

The colour-emotionality and form-non-emotionality (or control) hypotheses have most empirical foundation; the various hypothesised relationships between movement responses and personality factors are sustained. Colour responses and their correlation with extraversion receive enough backing to make the correlation tenable, though evidence for a form-introversion link remains insubstantial.

Concerning the other tests of perceptual style; studies relating colour-form dominance to extraversion-introversion have been fairly successful, though the emotionality-control hypothesis has gained less ground. Fairly good evidence has been evinced for the hypothesised interrelationships of movement threshold and personality traits.

Studies concerning the use of colour in painting have produced a broader substratum for the colour reactivity-emotionality hypothesis. Application of hypotheses concerning form and movement in a wider context like painting may be fruitful.

Evidence for the interrelationship of different measures of colour, form and movement responsiveness is equivocal. The relationship of Rorschach colour responsiveness and colour dominance is not supported by the results. Rorschach movement responses and movement threshold have not been correlated. The correspondence of Rorschach determinants and measures of colour, form and movement responsiveness outside a Rorschach setting hangs in the balance.

Results suggest that use of colour in paintings and Koh's Blocks bear some relationship to colour responses on Rorschach. The attested correspondence between ease of apparent movement and Rorschach movement responses would suggest that Rorschach M may relate to movement factors in a wider context.

Rorschach apart, whether colour-form dominance and movement threshold relate to similar reactivity



in a broader context, and in particular in relation to painting, has not been subject to experimental study.

On the whole, there is enough substantial material in these results to generate further exploration of the various facets of perceptual style in relation to one another, and to personality. The next chapter outlines a proposal for such a study.

## CHAPTER 3

### Method Tests

Specific hypotheses relating perceptual style and personality were discussed in the previous chapter. The model of personality organisation underlying this study and providing a framework for these hypotheses was discussed in Chapter 1. This model regards personality as the superordinate entity, divided into subsystems (or *anschauungen*), governing the manifestation of all individual differences including perception and personality traits.

Chapter 1 concluded that there was no reason to isolate the study of aesthetic response from the rest of personality. Previous studies and theories have made the mistake of doing this. Under Klein's scheme the aesthetic response becomes another manifestation of individual differences and is governed by the same subsystems of personality. To elucidate the personal strategies used by a percipient on confronting a work of art demands exploration of the aesthetic response in relation to measures of perceptual style and personality.

This chapter divides into five sections. The first section describes the method and design of the study. There follow sections describing tests of perceptual style, personality and aesthetic response. The latter section includes an outline of the aims and history of the art movements which subsume the paintings used in this study. This is necessary to justify the derivation of measures of "appropriate response". The fifth section is a description of the three other measures involved in this study and reasons for their inclusion.

Each subject completed the Keehn Colour – Form Dominance tests, the Movement Threshold ink blot test, and viewed fifteen slides of paintings. The procedure was in that order. Subjects also completed the 16PF questionnaire, either before or after undergoing the perceptual test battery and viewing the paintings. This was so that two subjects could be tested at a time; one subject filled in the questionnaire while another completed the perceptual tests. After the full test battery had been administered, subjects were interviewed concerning their interest in and knowledge of art.

In addition to the main test battery every subject did the Lüscher colour test, and subsamples selected randomly completed extra tests. Subjects involved in the extra testing made individual appointments to complete the tests at a later date. These tests comprised the following; the number of subjects involved is state in parenthesis; The Dynamic Personality Inventory (23); the Thurstone Colour – Form Test (34); Child's Inventory of Cognitive Controls (16); and the Rorschach Ink Blot Test (20).

The DPI was given to supplement the 16 PF, and is analysed alongside this questionnaire.

Though originally intended for the whole sample, Thurstone's colour-form test arrived from America after the main body of testing had been completed and it could only be given to those subjects (about half the sample) who could still be contacted in Edinburgh.

Other tests were administered for exploratory reasons. The Lüscher test was administered to the

whole sample because it takes a very short time. The Rorschach was deemed too elaborate and time-consuming to give to the whole sample; similarly Child's Inventory is rather long, and hence both these tests were given to subsamples.

Descriptions of these tests and details of administration and scoring are given below.

## 1. METHOD

The sample comprised 71 subjects involved in the first-year psychology course at Edinburgh University. Of this sample, 19 students were male and 52 female. The average age was 19.5 years.

Every subject was tested individually in a three-hour session, and given the Ishihara (1944) test for colour blindness before testing began, so that any subject who showed defective colour vision could be omitted from the study. In fact all subjects were included in the final analysis as no one showed defective colour vision.

Copies of the 16PF, DPI and Child's Inventory are not included in Appendices, as examples of scale items are given below.

## 2. MEASURES OF PERCEPTUAL STYLE-COLOUR, FORM AND MOVEMENT RESPONSIVENESS: COLOUR-FORM DOMINANCE TESTS:

The six tests to be described in this section were devised by Keehn (1953). In his study, Keehn used twenty-five tests of colour-form dominance. When these were factor-analysed, some were found to measure whole-part attitude and therefore were not used in this study. Other tests used by Keehn were not selected because they were difficult to replicate and administer. Of the tests selected, Stepping Stones, Odd One Out, Common Element, and Grouping had the highest loadings on the colour-form factor. Hidden Letter and Hidden Number had small loadings but were included in order to use as many tests as possible, and because they were easy to administer.

The tests are kept face down before the subject and he is given instructions before each test is shown. He is also told to do each one as quickly as possible.

### (i) Stepping Stones

This test consists of an arrangement of coloured shapes in three rows of six. There is an example card and a test card. The example card is shown to the subject and he is told that the correct path consists of moving from one turquoise triangle to the next, without jumping any coloured shapes between rows or columns. The test card is then presented to the subject and he is asked to point to the path across; this time the path can consist of similar colours of different shape, or similar shapes of different colour. The subject is scored as colour- or form-dominant depending on which path he chooses.

Keehn gives instructions as follows:

Turning to example card. "I want you to imagine there is a river running through here (between 'start' and 'finish'; indicate) and you are on this bank (point) and want to get to this bank (point to finish) and that some of these (pointing vaguely) are stepping stones. You can start on any of these you like (pointing at the three in the first column) and go in any direction you like, but you cannot jump. For instance, if you start here (pointing at the green square) the natural thing is to go here (pointing at the next green square) and so on until you cannot go on without jumping; and if you start here (pointing at top red circle and continuing as before). But if you start here (pointing to turquoise triangle) you see you can get right across (indicate with finger)." Turn over test card. "Now see if you can get across here."

#### (ii) Common Elements

The subject is shown an example card which has eight coloured figures on it, including three purple squares. The subject is told that the three purple squares share common elements: "You see that three of these are similar." The test card is then turned over and it is said "Now see if you can find three similar ones here." The test card also consists of eight coloured shapes but among them are three circles of different colour and three different shapes coloured green. The subject is asked to pick out the common element. The subject can therefore choose either colour or shape as the common element.

#### (iii) Odd One Out

This test consists of two purple triangles, two turquoise circles, an orange square, an orange triangle and a green triangle. The subject is asked to group the coloured shapes in pairs and indicate the odd one out. The instructions are: "The things on the next page are arranged in pairs with one left over. Which is the odd one?"

If the green and orange triangles are grouped as a pair (the common element being form) the subject chooses the orange square as the odd one out, and is scored form-dominant. If the orange square and orange triangle are grouped, the green triangle is chosen as the odd one out and the subject scored colour-dominant.

#### (iv) Grouping

This test consists of a card folded down the middle, with three groups of four squares in three different colours. The subject is asked to group the squares and this can be done either by colour or spatial juxtaposition. Instructions are: "The card is placed folded in front of the subject. "When I open this booklet you will see twelve little squares inside. They are in three groups of four, and I want you, as quickly as you can, to point out the three groups to me." If the subject groups the squares by colour, he is considered colour-dominant. If he groups them by spatial juxtaposition, he is scored form-dominant.

#### (v) Hidden Letter

This test consists of coloured lines geometrically arranged so that a capital L is formed by two lines of the same colour, and a capital T by two lines of different colour. The subject is asked to find a hidden letter, and is scored form-dominant if he chooses the T (ignoring colour differences) and colour-dominant if he chooses the L. Instructions are: "On the next page is a simple design. Hidden in it is an ordinary capital letter. Can you see it?"

#### (vi) Hidden Number

The subject is asked to pick out a number from an arrangement of coloured shapes. Similar shapes (triangles), in various colours, form a seven, and similar colours (blue) of different shapes form a six. If the subject sees a seven he is scored form-dominant; if he sees a six, colour-dominant. Instructions are: "The card is exposed. "Some of these make up the shape of a number and the rest are just to disguise and confuse you. Can you see the number?"

Keehn found the following percentages of colour-dominants on each test:

|                 |              |
|-----------------|--------------|
| Stepping Stones | 60%          |
| Common Elements | 35%          |
| Odd One Out     | 38%          |
| Grouping        | 42.5%        |
| Hidden Letter   | not reported |
| Hidden Number   | not reported |

#### The Thurstone Colour-Form Test

Though originally this test was intended to supplement the colour-form tests derived from Keehn, owing to delay in obtaining the test only 34 subjects actually completed it.

The Thurstone test is an adaption of the Schmidt Colour-Form Test described by Thurstone (1944) and comprises two films. The films consist of a series of coloured shapes arranged in a line and filmed in such a manner that the shapes can be seen to be moving in one of two directions. The test involves an apparent movement effect such that colour and shape interchange position and colour moves in one direction which shape moves in another. After a moving band of coloured shapes has been projected in the screen for 1.5 seconds and has disappeared two letters appear marking the position of each end of the band. Subjects are asked to record the letter towards which the line was seen to be moving. If the subject reports movement towards one direction he sees moving colours of flickering shape. If he reports movement in the opposite direction, he is following fixed shape alternating in colour. The subject is not usually aware of the ambiguous movement and spontaneously sees and reports movement in one direction. The subject who follows colour in spite of changes in form is considered colour-dominant, and the subject

who follows form in spite of colour change is considered form-dominant. Since there are many items in the test, subjects are scored in terms of degrees of colour-form dominant.

The Thurstone test consists of twelve different types of coloured shape or design. Each line of coloured shapes is seen twelve times at varying angles. Scoring followed standard procedure outlined by Thurstone (1952).

The value of the Thurstone test lies in its power to elicit an immediate spontaneous response from subjects in terms of colour and form responsiveness. Subjects are immediately compelled to see movement in one direction and are unaware of the basis of the effect-colour and form moving in opposite directions. In contrast, the colour-form tests derived from Keehn would admit some form of propensity or "set" to respond in terms of colour or form all the way through the six tests if subjects became aware of the fact that colour and form answers are equally admissible. Instructions for Keehn's tests stressed the necessity to respond immediately with first impression in order to circumvent the possibility of set as far as possible.

### **Movement Threshold**

The ink blots used to assess movement threshold were those devised by Barron (1955) and designed specifically to measure readiness to perceive human movement in ink blots. Barron wished to avoid using Rorschach in his particular study, which concerned the personality correlates of movement response tendency. His reason for this was the difficulty involved in isolating Rorschach variables like movement responsiveness, and he wished to avoid the productivity factor which plays a part in M production on Rorschach.

Barron constructed 150 achromatic ink blots, and tested 100 subjects. On the basis of frequency of movement response to each blot he selected 26 and arranged them in order, ranging from the blot which elicited fewest movement responses to that which elicited most. A subject's threshold for human movement is then the ordinal position of that blot in the series at which he first gives a human movement response. A score of one therefore indicates a low threshold for the perception of movement, or a propensity to see movement in a blot which does not frequently evoke such a response. A subject who scores a maximum of 27 does not see movement in any of the 26 blots, and has a high movement threshold.

In this study subjects were shown each ink blot in turn, and asked what it suggested to them. One response only was given to each blot.

### **The Rorschach Ink Blot Test**

20 subjects took part in the Rorschach Ink Blot Test. The standard series of ink blots were used, published by Hans Huber, Berne, in 1921. Instructions were that each subject should look at the ink

blots for as long as he liked, and report what he saw or what the ink blot suggested to him.

Scoring of Rorschach responses was according to Klopfer's system (1947).

### 3. PERSONALITY TESTS

#### The 16PF

Every subject completed the 16PF questionnaire, Form C; the latter is a shorter version of the 16PF and takes about thirty minutes to complete. This personality test was chosen because it is so comprehensive. Even though only certain dimensions were hypothesised in relation to other variables, it was considered that in an exploratory study of this nature it was better to cover as much of the personality spectrum as possible and look at other dimensions too. Cattell states (1970) that his test is "functional" — that is, the scales are not set up on a priori grounds, but directed towards previously-discovered personality structures. The 16PF, he states, was designed "to ensure initial coverage for all the behaviour that commonly enters ratings and the dictionary descriptions of personality."

The 16PF possesses "internal validity"; factor analysis dictated that the items chosen were good measures of the factors discovered. The mean correlation coefficient for all single items with the factors they represent is +.37. The mean correlation of each group of six items (for each scale) with the factor they represent is reported at +.71 (Cattell 1956).

Test-retest reliability is reported to range from +.71 to +.32 for the sixteen test scales. Reliability was ascertained for 200 students over a period of one week. Cattell remarks that some scales have not a very high reliability, but the factors cover what he terms "function fluctuation", or real changes in the level of traits. Since the main test battery was administered in the same three-hour testing session in this study, "function fluctuation" does not threaten to contaminate the results too much.

Factor analysis of Cattell's items produced sixteen primary factors. Further analysis derived several second-order factors; the two main second-stratum factors are especially relevant to the hypotheses under consideration. They are Exvia-Invia, comprising scales which tap different aspects of introversion-extraversion: A, E, F, H, and Q<sub>2</sub>-, and Anxiety, comprising scales which measure different aspects of neurosis, emotionality and anxiety. H- is also included in this group, along with C-, Q<sub>3</sub>-, O, Q<sub>4</sub>, and L.

Other primary factors which were especially relevant to hypothesis concerning "introversive-extravertive" personality traits were B, M, I and Q<sub>1</sub>. B represents intelligence and appears as a primary and second-stratum factor. M, I and Q<sub>1</sub> appear in different combinations for the second-stratum factors of Pathemia versus Cortertia (feeling versus cortical alertness), Independence (which Cattell relates to Witkin's (1948) field independence) and "Prodigal Subjectivity" (Introspection).

*A minus sign signifies that it is the low scores which contribute to this second-order factor.*



An outline of each factor follows. All references are to the 16PF Handbook; Cattell (1970).

#### **Factor A Sizothymia-Affectothymia**

Affectothymia means full and open expression of affect, sizothymia referring to flatness of affect.

High scores on this factor indicate a tendency to be easygoing, goodnatured, and interested in people; low scores signify critical, cool and aloof personality traits.

People who score high on factor A are those who tend to join groups, social workers and business executives; those who score low are artists, electricians and research scientists.

Cattell remarks that this factor carries a high hereditary component.

Items representing this factor are "I could happily live alone, far from anyone like a hermit" (Disagree).

"I could be happy in a job that required me to listen to unpleasant complaints all day from employees and customers" (Agree).

#### **Factor B Intelligence**

High scores on this factor indicate intelligence, insight, ability to learn quickly and intellectual adaptability; low scores low mental capacity and inability to handle abstract problems.

Cattell points out that this is a "crystallised power measure" of intelligence, and as such it does not correlate with a speeded intelligence test. The scale has been found to be an adequate measure of general ability and useful in vocational selection and "in almost all clinical fields".

Cattell also suggests that factor B has a large hereditary component. In an adult sample he found that the scores of identical (MZ) twins were more alike than fraternal (DZ) twins.

Items representing this factor are:

"I think the opposite of inexact is: (a) casual (b) accurate (c) rough"

"I think the proper number to continue the series 1,2,3,6,5, is (a) 10 (b) 5 (c) 7"

#### **Factor C Ego Strength**

The term ego strength is psychoanalytic. High scores on this factor indicate emotional maturity, stability and constancy of interests. Low scores indicate emotional behaviour in frustrating situations, tendencies to be easily annoyed, changeable and impulsive.

The low C scoring person shows general neurotic responses, in the form of phobias, psychomatic disturbances, sleep disturbances and hysterical and obsessional behaviour.

Cattell identifies this factor with Eysenck's general neuroticism factor.

Those who score high on this factor are leaders, members of groups with high morale, pilots, administrators and those who have had frontal lobotomies and successful psychotherapy.



Those who score low are neurotics, psychotics, alcoholics, drug addicts, postmen, clerks, janitors and writers — occupations that do not demand sudden adjustments and in which the individual can set his own pace.

Items representing this factor are:

“I get impatient, and begin to fume and fret, when people delay me unnecessarily” (Disagree).

“I always have lost of energy at times when I need it” (Agree).

#### **Factor E      Submissiveness — Dominance**

High scores on factor E indicate assertive, independent behaviour. Low scores signify submissive dependent and conventional behaviour.

Cattell points out that certain traits are more highly loaded on the E factor for women. These traits are hypochondriasis, social poise, prominence, and attention-getting behaviour.

Those who score high on factor E are leaders, and those of higher social status, athletes, airmen, research scientists, and people in a democratic group with effective role interaction.

Those who score low are farmers, cooks, janitors, artists, university administrators and physicists.

Items representing this factor are:

“I am quite happy to be waited on, at appropriate times, by personal servants” (Agree)

“People say that I like to have things done my own way” (Agree).

#### **Factor F      Desurgency — Surgency**

High scores on this factor indicate tendencies to be talkative, enthusiastic, cheerful, frank and expressive. Low scores indicate tendencies to be silent, introspective, full of cares, and uncommunicative.

This is one of the most important components of extraversion.

This factor does not indicate depression, rather it is indicative of soberness. People high on factor F have less exacting aspirations. Scores decline with age, and “increasing load of care”.

People score high on this factor after frontal lobotomies, psychotherapy and mild alcoholic intoxication.

Items representing this factor are:

“I greatly enjoy all large gatherings, like parties or dances” (Agree).

“I feel a bit awkward in company and do not show up quite so well as I should” (Disagree).

#### **Factor G      Superego Strength**

Like factor C, this factor derives its name from psychoanalytic terminology. It bears some relation to factor C; they resemble each other “notably in their contribution to self-controlled behaviour and regard for others, as opposed to emotional and impulsive behaviour” (Cattell 1970). Whereas C indicates

natural integration and stability of ego strength, G represents more instilled, early implanted behaviour and conscience.

High scores on factor G indicate tendencies to be persevering, determined, responsible, emotionally disciplined, and concerned with rules and moral standards. Low scores are indicative of fickleness, frivolity, self-indulgence, and disregard of obligations to others.

G is particularly liable to faking responses; criminals seeking parole tend to score high.

People scoring high include high achievers at school and in general, leaders, and airline pilots. Those scoring low are delinquents, sociopaths, homosexuals, and criminals.

Items representing this factor are:

"I think people should observe moral laws more strictly than they do" (Agree).

"I feel that

(a) some jobs just do not need doing so carefully as others.

(b) any job should be done thoroughly if you do it at all" (b).

#### **Factor H      Threctia — Parmia**

The term threctia is an acronym derived from "high susceptibility to threat". Its opposite, parmia, indicates tendencies to be adventurous, active, impulsive and liking to meet people, and these traits are reflected in high scores. Low scores signify tendencies to be shy, withdrawn, cautious and restrained, that is, highly susceptible to threat. Clinically low scores are indicative of proneness to schizoid disorders, tuberculosis and ulcers.

The basis of threctia, according to Cattell, is an overresponsive nervous system predisposing an individual to be threat-reactive. Parmic tendencies derive from an under-reactive nervous system and predispose the individual to be bold, socially, sexually and emotionally. Cattell suggests that parmia has a high hereditary component.

Scores become higher with age. People scoring high on factor H are leaders, aimmen, administrators and those who organise clubs and teams.

Items representing this factor are:

"Most people I see at a party are undoubtedly glad to meet me" (Agree).

"In streets or stores I dislike the way some people stare at me" (Disagree).

#### **Factor I      Harria — Premsia**

Premsia is an acronym for "projected emotional sensitivity". High scores on factor I indicate such emotional sensitivity, insecurity, dependence, and tendencies to expect attention, be imaginative in inner life, and act on sensitive intuition. Low scores indicate tendencies to be self-reliant, tough-minded, expecting little, unaffected by fantasies, and act on logical and practical evidence.

This approximates to the Tender-Tough dimension first popularised by William James.

Women tend to score higher on factor I. Low scores on this factor indicate tough masculine realistic and practical traits.

Questionnaire correlations reveal the relationship of premisia to unrealistic, imaginative, and aesthetic traits. Cattell also states that this factor is largely environmental and cultural.

People who score high on factor I are sociopaths, drug addicts, smokers, employment counsellors, musicians and artists. High scores are also significantly related to mental breakdown. Low scores are achieved by electricians, policemen and mechanics.

Items representing this factor are:

"Discouraging circumstances can bring me near to tears" (Agree).

"I would rather be

(a) a bishop (b) a colonel" (b).

#### **Factor L Alaxia — Protension**

Protension is again an acronym for "projection and inner tension". High scores are indicative of this and it is manifested in jealous, dogmatic, personality traits. Low scores indicate acceptance of personal unimportance, liberality and permissiveness.

Protension signifies a habitual adoption of a particular defence mechanism. High tension indicated by factor L (it is connected with the second-stratum anxiety factor) breeds social insecurity and compensatory behaviour and projection. It is expected that this personality factor plays a part in paranoia.

Factor L is related to traits comprising the E factor pattern. Some of the traits, Cattell remarks, popularly attributed to dominance (factor E) actually belong to the L constellation.

People who score high on L are unpopular in groups, and include time-study engineers and accountants. Low scores are achieved by school counsellors and social workers.

There is apparently some evidence of a genetic origin for factor L.

Items representing this factor are:

"I suspect that people who act friendly to me can be disloyal behind my back: (a) yes, generally (b) occasionally (c) no, rarely" (a).

"I think many foreign countries are actually more friendly than we suppose" (Disagree).

#### **Factor M Praxernia — Autia**

Praxernia is an acronym for "practical concern", autia for "internal autonomy".

High scores on factor M indicate tendencies to be unconventional, and absorbed in inner creations and ideas, especially Art, Theory and Basic Beliefs. Low scores are indicative of such traits as conventionality, practicality, and tendencies to be prosaic, avoid fantasy, and concern with immediate interests

and issues.

Autia, as the name "internal autonomy" implies, is characterised by subjectivity and inner mental life. It involves internal spasmodic anxiety, and hysteroid episodes of immature, demanding and overwrought behaviour.

High scores are achieved by artists, researchers, planning executives and editors. Low scores are achieved by those involved in work demanding a mechanical sense, realism, and alertness.

Items representing this factor are:

"There are times, every day, when I want to enjoy my own thoughts uninterrupted by other people" (Agree).

"I find it helpful to pace up and down when I am thinking" (Agree).

#### **Factor N      Naivete — Shrewdness**

High scores on this factor indicate tendencies to be polished, socially aware, exact, calculating, emotionally detached, artful, ambitious and insightful. Low scores are indicative of tendencies to be socially clumsy, genuine, vague, injudicious, gregarious, easily involved, natural, lacking insight and not ambitious.

Cattell adds a proviso to this Machiavellian gamut: "Possibly it changes expression appreciably in different subgroups." As with factor M, Cattell remarks that the dimension of naivete-shrewdness is clear enough but getting items to tap these dimensions has taken "over a decade".

Traits involved in factor N are probably largely acquired.

Factor N is negatively associated with pathology, schizophrenia and neurosis.

High scores are achieved by those in skilled professions: engineers, accountants, electricians. People who score low are nurses, cooks, missionary priests, and convicts.

Items representing this factor are:

"I get annoyed at being held up by small rules and regulations which, I admit, are really necessary" (Agree).

"I generally fail to notice hidden propaganda in what I read, unless someone points to it" (Disagree).

#### **Factor O      Untroubled Adequacy — Guilt Proneness**

Factor O differs from factor C in that it distinguishes those who act out maladjustment rather than suffer it as internal conflict. In relation to G, standing for the "classical superego", O is the guilt felt after infringement of conscience, the poorness of spirit and general unworthiness that G traits strive to prevent.

People who score high on factor O are anxious, worrying, depressive, easily upset, phobic, lonely and brooding. Low scores indicate self-confidence, cheerfulness, resilience and fearlessness.

Those scoring high involve religious groups, artists, farmers and editors. Those scoring low are athletes, electricians, mechanics, nurses and sales managers.

Clinically, O is a large factor in anxiety. Neurotics, alcoholics and psychotics score high.

Studies suggest that O carries a large constitutional component.

Items representing this factor are:

"I find it wise to avoid excessive excitement because it tends to wear me out" (Agree).

"I think every story and movie should remind us of a moral" (Disagree).

The following factors are styled Q<sub>1</sub> Q<sub>2</sub> Q<sub>3</sub> and Q<sub>4</sub> because they do not appear in behavioural ratings, and are only identified by questionnaire responses, in which, Cattell suggests, the subject lays out his "mental interior".

#### **Factor Q<sub>1</sub>      Conservatism — Radicalism**

This factor comprises more than a group of acquired attitudes. The theory that it is not just a political factor is supported, according to Cattell, by correlations with external criteria such as counsellor effectiveness.

High scores on Q<sub>1</sub> indicate traits involving experimenting, liberal analytical free thought. Low scores indicate tendencies to be conservative and respectful of established traditional ideas.

People who score high are executives, university professors and scientific researchers. Those who score low include policemen and nurses.

Items representing this factor are:

"If I were good at both I would rather play at (a) chess (b) bowling" (a).

"More trouble arises from people (a) changing and meddling with ways that are already o.k. (b) turning down new, promising methods" (b).

#### **Factor Q<sub>2</sub>      Group Dependency — Self Sufficiency**

High scores on this factor indicate resourceful traits, and preference for one's own decisions. Low scores are indicative of group dependence and sociability.

This is a major factor in Introversion.

High scorers include farmers, writers, scientists and criminals. High scores are significantly associated with schizophrenia.

Items representing this factor are:

"I sometimes hesitate to use my own ideas, for fear they might be impractical" (Disagree).

"When I plan something, I like to do so quite alone, without any outside help" (Agree).

### **Factor Q<sub>3</sub>    Low Self-Sentiment Integration — High-Strength Self-Sentiment**

This factor represents the extent of an individual's concern about his self concept and social image. High scores indicate that an individual is controlled and has exacting willpower; that he is socially precise, compulsively following his self image. Low scores indicate tendencies to be uncontrolled, lax, following own urges and careless of protocol.

High scores are achieved by leaders, mechanics, mathematicians, and those involved in productive and organisational activities; by pilots and those who need to exercise objectivity and decisiveness — university administrators and electricians.

This factor is negatively loaded on the second-stratum factor of anxiety.

Items representing this factor are:

"Prim, strict people do not seem to get on well with me" (Disagree).

"I get rather fantastic or ridiculous dreams (in sleep)" (Disagree).

### **Factor Q<sub>4</sub>    Low Ergic Tension — High Ergic Tension**

This factor represents the level of excitement and tension (id or ergic need) which is undischarged, poorly controlled, and in excess of ego strength capacity to discharge it. When scores on Q<sub>4</sub> are high this means that the tension or ergic need becomes misdirected and converted to psychosomia or anxiety.

As contrast to the factors O and C-, Q<sub>4</sub> represents irrational worry and anxiety.

High scores on this factor indicate tendencies to be tense and frustrated. Low scores indicate relaxed, unfrustrated character traits.

Clinically Q<sub>4</sub>, along with O, C-, and I differentiates neurotics from normals. High scores are achieved by manic depressives (in both manic and depressive phases). In fact Q<sub>4</sub> has the largest demonstrated association with clinical depression.

High scores are achieved by editors, low scores by pilots.

Items representing this factor are:

"If left in a lonely house I tend, after a time, to feel a bit anxious or fearful" (Agree).

"I get strong emotional moods — anxiety, anger, laughter, etc. — that seem to arise without much actual cause" (Agree).

### **The Dynamic Personality Inventory**

This questionnaire was given to a subsample of students randomly selected from the main sample, and comprising 23 subjects.

The DPI, designed by T. Grygier, has no published norms; the DPI Handbook is still in the final stages of completion. The inventory was included in this study for exploratory reasons, and partly to supplement the 16PF. In particular the specific measure of impulsivity (O<sub>i</sub> and related scales) was con-



sidered of value, since the 16PF does not treat this trait separately.

The 325 items on the DPI are designed to cover 32 traits. Items take the form of a list of activities and objects which the subject marks "like" or "dislike", on a separate answer form.

As the questionnaire is based on Freudian theory, the main personality trait measures comprise oral (7 traits), anal (6) and phallic (7). These are outlined below, along with twelve other traits which do not group themselves according to any specific pattern.

Essentially, the DPI measures personality traits derived from various stage of development. Fixation at the oral stage of development, according to Freudian theory, leads to the persistence of infantile dependence in adulthood. It can also lead to a reaction formation against this dependence. These traits are tapped by the Od and Om scales respectively.

Fixation at the stage when a child is learning to bite leads to argumentativeness and sarcasm.

These traits are covered by the scales OA and Ov. Other traits generally derived from the oral stage of development are impulsivity, and liking for the unconventional. The scales Oi and Ou cover these traits. The oral scale, O, measures a general tendency to display personality characteristics derived from the oral stage of development.

Toilet training marks the first decisive experience a child has with external regulation of natural functions. Strict toilet training may lead to traits derived from the desire to retain faeces: obstinacy, dogmatism, obsessive behaviour and pedantry, and these traits are covered by the Aa, Ad, Ai and Ac scales. Traits derived from overconcern with the expulsive function are emphasis on authority and cruelty; these traits are measured by the scales Aa and As.

Competition for the attention of the parent of the opposite sex, with the parent of the same sex, inherent in the Oedipus and Electra complexes, leads in adulthood to competitiveness, exhibitionism and ambition. This is the Icarus Complex. Pi, Pa, Ph and Pf measure different aspects of this complex, while Pe reflects exhibitionist tendencies, and Pn the exhibitionist needs inherent in narcissism. The Phallic or P scale taps the core of the phallic trait gamut, reflecting tendencies towards phallic traits specifically identified by individual scales.

Four other scales are also firmly placed in the structure of Freudian theory; these are Ws, Wp, EI, and EP.

Womb Phantasy, or desire to return to the womb, is reflected by two scales Wp and Ws, which mirror different aspects of womb phantasy.

Ego strength, or the ability to mediate between immediate need gratification and reality demands, is measured variously by EP and EI.

Other traits measured which are not specifically derived from Freudian theory are SA, interest in social activities; C, interest in children; CI, creative interests; TI, tactile interests; H, hypocrisy; S, sexuality; M, masculinity, and F, femininity.

The next section comprises a synopsis of the traits measured by the 32 DPI scales. It is derived from an account privately distributed by Mrs. T. Grygier prior to publication of the DPI Handbook (Grygier 1969). All references are to this document.

Description of the trait covered by the scale is prefaced by a crystallised description of the type of item representing the scale. Description of each scale involves a general account of the type of personality pattern found to relate to high and low scores, as revealed by correlations of the scales with behavioural and clinical ratings, and reported by Mrs. Grygier. They are reported in this way, and not specifically as correlations in order to give an overall picture and avoid repetition. Correlations of scales with the MMPI, the Allport-Vernon Study of Values Inventory and the Rorschach are reported specifically, where appropriate.

## ORAL SCALES

### **O      Orality — interest in food; liking for sweet creamy foods**

This scale is related to traits such as impulsiveness, sociability and self-indulgence.

It correlates with the Mf scale of the MMPI (see Hathaway and McKinley 1943) and links an interest in feminine pursuits.

### **O      Oral Aggression — interest in crunching, strong drinks and savoury food**

High scores signify impulsivity, and need for autonomy and independence.

Low scores indicate need for order, naive thinking, regression and childishness, stereotypy and concreteness of thought.

### **Od     Oral Dependence — need for guidance from parents and parental substitutes**

High scores indicate a clinging dependent attitude, need for security, good personal relationships and emotional warmth, overcaution in approach to problems, introjection as a defence, and reliance on conventional and other directed judgements.

Low scores indicate personality strength under stress, intellectual interests, need for independence, ability to handle social situations, feelings of impatience with oneself, and of being unwanted and unloved.

The Od scale correlates with the (additional) Si scale of the MMPI; this is indicative of a relationship of Od and social introversion — withdrawal from personal contacts.

### **Om     Movement — a reaction formation against oral dependence; need for autonomy, taking risks, breaking emotional ties, and tolerance of insecurity**

High scores indicate insistence on emotional independence and fear of losing individuality; partici-

pation in outdoor activities, self-confidence, emotional maturity, intelligence and need for creative work

Low scores indicate unconcern with independence, shyness, and need for security. They may indicate emotional insecurity that may lead to an affectionless cold character, unable to either give or accept affection.

**Ov Verbal Aggression — attack on accepted points of view, expression of unpopular opinions**

High scores indicate intellectually aggressive and self-assertive behaviour — sarcasm, critical wit, tendency to influence and manage people, self-confidence, dominance, impulsiveness, originality and flexibility of thought, and rebellion towards authority.

Low scores indicate inability to express aggression verbally, lack of awareness of aggression, shyness, suggestibility, stereotype, concreteness of thought, reliance on other directed judgements, use of introjection as a defence, and need for security.

Ov correlates with the Ma scale of the MMPI: the latter is indicative of hypomania, signifying overproductivity of thought and action.

It also correlates with clinical ratings of selfishness, being manipulating and demanding in relationships, emphasising independence, and seeking positions of authority.

**Oi Impulsiveness — changeability, smoking, lack of postponement of gratification**

High scores indicate emotional expression and impulsiveness; self-confidence, alert behaviour, quick personal tempo, flexibility, original and fluent ideas, and autonomy.

Low scores signify overly delay and control of impulses, naïve thinking, need for order, dependence on conventional judgements, introjection, shyness.

This scale correlates negatively with percentage of good form responses on Rorschach and the Hs scale of the MMPI suggesting a negative relationship with hypochondriacal symptoms.

**Ou Unconventionality — liking for unconventional things**

High scores indicate attraction to out-of-the-ordinary things, intelligence, wide range of interests, self-confidence, and clear communication of ideas.

Low scores indicate conventionality, shyness, tendency to be self-effacing, need for security, order and thrift, inhibition and overcontrol.

Ou correlates with the number of crude, anal, sexual and uncontrolled responses on the Rorschach.

## ANAL SCALES

**Ah Hoarding — holding on to possessions, persistent behaviour, undoing knots**

High scores indicate stubborn clinging persistence, planning ability, and responsibility towards work.

Low scores indicate little interest in material possessions.

The Ah scale correlates with percentage of good form responses on Rorschach and the Hs, Ma and Hy scales of the MMPI. The latter correlations suggest that Ah relates to hypochondriasis, hypomania or overproductivity of thought and action, and hysterical conversion symptoms such as fainting and paralysis.

It negatively correlates with ego strength, autonomy needs and ability to withstand stress.

**Ad      Attention to Details — paying attention to small details, planning a timetable**

High scores indicate obsessive compulsive reactions, orderlines, conscientiousness and perfectionism; intelligence, clear-mindedness, self-confidence, assertion and pedantry.

Low scores signify eclectic philosophy of life and independence.

**Ac      Conservatism — upright moral standards, practical ideas**

High scores indicate rigidity, tendency to stick to routine, stability, social conformity, overcontrol and inhibition of impulses, and conventional and other directed judgements.

Low scores indicate dislike of routine and accepted standards, intelligence, self-confidence, impulsivity, need for a creative job, independence and ego strength. According to Grygier, the Ac scale correlates with a number of exhibitionistic, voyeuristic responses on Rorschach, though she does not indicate how the Rorschach responses are defined.

**Aa      Authority — submissiveness to authority — parents, order**

High scores indicate deference to authority and status, social conformity and need for job security.

Low scores indicate independence and ego strength.

**As      Sadism — belief in strict discipline, cruel laws and strong authority**

High scores indicate an authoritarian attitude, enforcing conformity by strict primitive laws, desire for status and power ethnocentrism, narcissism, emotional lability, tenseness, restlessness, hostility, and manipulation and demand in relationships.

Low scores indicate easy-going tolerance, intelligence, ego strength, well modulated affect, participation in sports, rumination and vacillation.

The As scale correlates with the Californian scales of Fascism and Ethnocentrism.

**Ai      Insularity — racial and social prejudice, being on guard with strangers, keeping oneself to oneself**

High scores indicate emotional distance and reserve, suspicion and mistrust, in-group out-group distinctions, and racial prejudice.

Low scores indicate liberality of outlook, intelligence and creative imagination.

This scale correlates with the Pt scale on the MMPI. This indicates that Ai relates to psychasthenia or obsessive-compulsive traits and mild depression.

## PHALLIC SCALES

**P      Phallic Symbols — interest in objects of phallic symbolic significance — torches, flagpoles, lighthouses**

High scores on this scale indicate interest in phallic objects, self-confidence, self-assertion, exhibitionism, extraversion and forcefulness.

Low scores are indicative of sexual inadequacy and feelings of being unwanted and unloved.

The P scale correlates with the Hy and Ma scales of the MMPI indicating a relationship with hypochondriasis, and hypomanic activities or overactivity in thought and action.

It also correlates with political interests as shown by the Allport-Vernon Study of Values Inventory (1931).

**Pn      Narcissism — interest in clothes and appearance, in fur, textures and luxury**

High scores indicate concern for appearance and social perceptiveness.

Low scores are indicative of feelings of being unwanted and unloved, and sexual inadequacy.

The Pn scale correlates with narcissistic and libidinal responses on Rorschach.

**Pe      Exhibitionism — interest in posing for a picture, appearing on television**

High scores indicate conscious enjoyment of attention and admiration, leadership qualities, self-confidence, irresponsibility, manipulating and demanding tendencies, cheerfulness and being a bad mixer.

Low scores indicate self-effacement, shyness, naive thinking and sexual inadequacy.

The Pe scale correlates with the Ma scale of the MMPI, indicating a relationship with hypomanic tendencies, and overactivity.

**Pa      Ascension: representing the Active Icarus Complex — psychophysical drive for achievement — interest in flying, riding, pole vaulting and driving**

High scores on the Pa scale indicate a high aspiration level, keenly competitive spirit, intelligence, creative potential, self-confidence and leadership.

Low scores indicate responsibility, reliability, being a good mixer, needs for security and ability to get on well with subordinates.

**Ph Height:** representing the Passive Icarus Complex — fascination by height and distance — stars, vast plains and clouds

High scores on this scale indicate large aspirations at the fantasy level, clear constructive ideas, need for creative work, self-assertion and independence.

Low scores indicate shyness, sexual inadequacy and need for job security.

**Pf Fire:** representing the sensual aspects of the Icarus Complex — fascination by fire, winds, storms and explosions

High scores indicate perceptiveness of sensual impressions, high sensitivity that may lead to vivid imagination, intelligence, self-confidence and exhibitionism.

Low scores indicate repression, phobic reactions, shyness, sexual inadequacy and need for job security.

The Pf scale correlates with the Hy scale of the MMPI, indicating a correlation with tendencies to hysterical conversion symptoms and immaturity.

**Pi Icaran Exploits — interest in explorative activities — South Pole exhibitions, exploration of unknown lands**

High scores on the Pi scale indicate liking for adventure, physical risk, leadership, self-confidence, intelligence, sports and social activities, production and clear expression of ideas, ego strength and adaptive imagination.

Low scores indicate dislike of physical risk and concern for security; sexual inadequacy and the ability to mix well.

This scale correlates with exhibitionistic responses on the Rorschach.

## EGO STRENGTH SCALES

**EP Persistence:** renewed efforts after failure, tenacity in arguments

High scores on the EP scale indicate ego defensive persistence, the tendency to react with renewed effort in the face of difficulties, intelligence, maturity, frequent elation and the need for job achievement.

Low scores indicate tendency to break under stress, and job needs for security.

The EP scale correlates negatively with aesthetic interests on the Allport-Vernon Study of Values Inventory (1932).

**EI Initiative:** interest in planning and organisation

High scores on this scale indicate self-reliance, management ability, leadership, high aspiration level, emotional maturity, self-confidence, wide range of interests, self-assertion, tendencies to be manipulative and demanding, and dominance.

Low scores indicate inertia, indecision and lack of self-confidence, stereotype of thought, naive thinking, anxiety, shyness and suggestibility.

The EI scale correlates positively with the Ma scale and negatively with the Si and D scales of the MMPI. Ei therefore relates to hypomania, overactivity in thought and action; it negatively relates to social introversion, and depressive tendencies including inferiority feelings, proneness to worry, narrow range of interests and social extraversion.

## WOMB PHANTASY SCALES

**Wp Womb Passivity: liking for comfort and warmth, soft pillows, baths, warm rooms**

High scores indicate liking for mild sensual impressions, passive depression, hostility and breaking down under difficulties.

Low scores indicate active pursuits.

**Ws Womb seclusion: liking for seclusion, working in a small room alone, cottage in the woods**

High scores indicate seclusion and introspection as a defence against social anxiety, the need to withdraw from human contacts, anxiety, creative originality and lack of participation in social gatherings.

Low scores indicate active outgoing activities.

The Ws scale is related to Rorschach introversive tendencies.

## OTHER SCALES

**H Hypocrisy: respect for authority, satisfaction with own moral standards, taking things seriously**

High scores indicate social conformity, subservience to and desire for positions of authority, and satisfaction with one's own standards of behaviour.

Low scores indicate rejection of accepted social standards, awareness of one's own antisocial tendencies, introspection and doubt, sexual inadequacy, social introversion and ego strength.

The H scale correlates with the Lie scale of the MMPI, and religious interests on the Allport-Vernon Study of Values Inventory.

**S Sexuality: liking for sexual excitement, sexual dreams**

High scores indicate conscious acceptance of sexual impulses, intelligence and ego strength.

Low scores indicate naive thinking, need for order and thrift and pleasant and friendly attitudes.

The S scale correlates with crude libidinal responses on the Rorschach.

**TI Tactile Impressions: interest in tactile impressions and materials — clay, building, varnishing**

High scores indicate an interest in creative manipulation of objects, art and handicrafts, ability to



express oneself clearly and need for achievement.

Low scores indicate unwanted and unloved feelings, responsibility and reliability.

**CI Creative Interests: interest in drawing, painting and designing**

High scores indicate creative, artistic and intellectual interests, intelligence, creative imagination, and originality, clear expression of ideas and leadership aspirations.

Low scores indicate shyness and passivity.

**M Masculinity — interest in outdoor activities, masculine roles**

High scores indicate practicality, dominance, self-assertion, emotional maturity, self-reliance, leadership, alertness and quick tempo.

Low scores indicate sexual inadequacy, shyness, anxiety, need for job security and ability to analyse problems.

The M scale correlates positively with the Ma scale and negatively with the Mf scale (scored in the direction of femininity) of the MMPI. This indicates that M relates to hypomanic tendencies of overproduction of thought and action, and negatively relates to femininity.

**F Femininity: interest in social work, flower arranging, dress designing**

High scores indicate tendency to adopt feminine roles and interests, overcaution and tendency to break down under stress.

Low scores indicate tolerance of stress, and ego strength.

The F scale correlates negatively with theoretical interests on the Allport-Vernon Study of Values Inventory.

**SA Social Activities: interest in social gatherings, inviting people to a party**

High scores indicate gregariousness, extraversion, social intelligence, verbal fluency and concern for making a good impression.

Low scores indicate social extraversion. The SA scale correlates negatively with the Si, Mf and D scales on the MMPI. This means that SA relates negatively to social introversion and withdrawal from contacts, femininity, and depressive tendencies.

**C Children: interest in children, and joining in their activities**

High scores indicate a need to give affection, seeking of warm personal relationships, socialability, leadership qualities and lack of neurotic traits.

Low scores indicate cold, schizoid tendencies.

The C scale correlates with religious interests on the Allport-Vernon Study of Values Inventory, and the Ma scale of the MMPI, the latter indicating a relationship with hypomanic tendencies or overproduction of thought and action.

### THE LÜSCHER COLOUR TEST

This test, designed by Max Lüscher (1949), was administered to all subjects. The original full form of the test comprises 73 different colours; in this study the shorter form of the test, involving eight colours, was used. These eight colours are randomly aligned in front of the subject. The subject is then asked to choose the colour he most prefers, without reference to objects or clothes, and this colour is taken from the line and placed face down in front of the tester. From the colours that remain, the subject is asked to choose the most-preferred colour, and the same procedure is followed for each remaining group of colours. The same procedure is then repeated again so that two series of colour preferences are delineated for each subject.

Responses were scored according to Lüscher's method (1949). When a Lüscher preference selection is scored, the colours are grouped into pairs, known as functions. The first function, or two colours chosen as most preferred, represents the desired objectives of the subject, the second his existing behaviour, the third characteristics he holds under restraint, the fourth, that is, the two colours most liked, anxiety-laden characteristics, and the fifth function, which comprises first and last colours chosen, indicates the subject's actual problem. Each colour is numbered (grey is 0, blue is 1, and so on) and the choice annotated so that the first two preferred colours are given + signs, the second x signs, the third = signs and the fourth — signs. A subject's personality profile is then discovered by looking up the appropriate functions in the Lüscher manual (1949).

The following is an example of a typical personality profile taken from the manual:

+ Functions +1+0  
Blue/Grey

"Needs release from stress, longs for peace, tranquility and contentment."

x Functions x5x2  
Violet/Green

"Seeks a close and understanding bond in an atmosphere of shared intimacy as a protection against anxiety and confusion."

= Functions =3=7  
Red/Black

"Circumstances are restricting and hampering, forcing him to forgo all joys and pleasures for the time being."

— Functions —4—6  
Yellow/Brown

"The existing situation is disagreeable. Feels lonely and uncertain as he has an unsatisfied need to ally himself with others whose standards are as high as his own  
..."

+ — Functions +1 —6  
Blue/Brown

"Wants to be valued and respected  
and seeks this from a close and  
peaceful association of mutual  
esteem"

It is clear that a personality description such as that outlined above could not be related to other test scores. The first problem is the sheer length of the description, and the different functions involved. For the purposes of this analysis, only the subject's third and fourth colour choices were used. Therefore the x functions representing 'existing behaviour', were extracted and the descriptions' relating to them were taken from the Lüscher manual.

The personality descriptions resulting from the placing of one colour (for example green) in third position and another colour (for example brown) in fourth position differs in varying degrees from that which results when the colours are reversed (brown in third, green in fourth). A total of 49 descriptions can emerge from the colour combinations comprising the x function. Very few subjects in fact placed black in third or fourth position and therefore about 42 descriptions emerged from the x functions chosen by the subjects in this sample.

Analysis of 42 descriptions in relation to other tests is a formidable problem, therefore some method of grouping these descriptions had to be found. Descriptions were therefore grouped when they seemed to refer to similar behaviour. For example the x function x3x4 (red/yellow) reads: "Seeks success, stimulation and a life full of experience", the x function x2x3 (green/red) reads: "Seeks success, wants to overcome obstacles and make his own decisions", and the x function x3x2 (red/green) "Pursues his objectives with intensity and does not allow himself to be deflected from his purpose". Such descriptions were taken to refer to behaviour motivated by desire to succeed, and grouped under the rubric "Ambition". Seven groupings thus emerged. Four of these seem to refer to extraversion-introversion (1, 3, 4, and 5). Two seem to relate to emotionality (2 and 6). The remaining profile (7) specifically relates to aesthetic sensitivity.

These profiles are summarised below, with the more frequent colour choices, which emerged in various combinations, in parenthesis.

#### 1. *Withdrawal* (blue, grey, black).

This profile involved social introversion. Descriptions were of the following type: "Feels cut off from harmony and co-operation". Prefers comfort to ambition.

#### 2. *Inhibition* (blue, grey, black\*)

This profile involved emotional reserve and control, following this type of description: "Won't allow intimate involvement without reserve". "Egocentrically involved".

\* The combinations of colour comprising this profile differ from those comprising profile 1.  
This also applies to profiles 4, 5, and 6.

### 3. *Group Dependence* (red, green, yellow)

This involved the following descriptions: "Works well in a group, not a leader". "Intensely involved in life". "Volatile, impulsive".

### 4. *Social Extraversion* (red, green, yellow)

This involved such descriptions as "Readily participant"; "Active, outgoing, and restless".

### 5. *Ambition* (red, green, yellow)

This trait involved such descriptions as "Demands esteem as an exceptional individual"; "Outgoing, emotionally shallow".

### 6. *Sensitivity* (brown and other colours)

This profile comprised descriptions involving emotionality and insecurity, of the following type: "Hurt if not recognised". Wants a close bond and emotional fulfilment".

### 7. *Aesthetic sensitivity* (violet and other colours)

Descriptions were of the following order: "Aesthetically sensitive"; "Imaginative".

Lüscher personality descriptions having been grouped in this way, it was possible to relate them to other test scores. In order to test hypotheses relating to extraversion-introversion; for example, it was possible to compare all subjects who had descriptions pertaining to profile 1, (withdrawal) with those who had descriptions relating to profile 4, (social extraversion).

## 4. MEASURES OF AESTHETIC RESPONSE

### A. The Paintings

Fifteen colour slides of paintings were shown to all subjects. These slides comprised three sets of five, representing the three movements of Expressionism, Cubism and Futurism. The slides were the following:

#### *Expressionism:*

|                       |                        |      |                                  |
|-----------------------|------------------------|------|----------------------------------|
| Emil Nolde            | 'Kerzentanzerinnen'    | 1912 | (Nolde Museum Seebull)           |
|                       | 'The Sea B'            | 1916 | (Tate Gallery)                   |
|                       | 'Landschaft mit Muhle' | 1932 | (Neue Stattsgalerie Munchen)     |
|                       | 'Blumen and Wolken'    | 1933 | (Nolde Museum Seebull)           |
| Karl Schmidt-Rottluff | 'Houses at Night'      | 1912 | (Museum of Modern Art, New York) |

#### *Cubism:*

|                |                        |         |                                  |
|----------------|------------------------|---------|----------------------------------|
| Georges Braque | 'Mandolin'             | 1909-10 | (Tate Gallery)                   |
|                | 'Still Life with Fish' | "       | (Tate Gallery)                   |
|                | 'The Portuguese'       | 1911    | (Kunstmuseum, Basle)             |
| Pablo Picasso  | 'Ma Jolie'             | 1911-12 | (Museum of Modern Art, New York) |

|                  |   |      |                                  |
|------------------|---|------|----------------------------------|
|                  | 'Violon et Cruche'                        | 1910 | (Kunstmuseum, Basle)             |
| <i>Futurism:</i> |   |      |                                  |
| Umberto Boccioni | 'The City Rises'                          | 1910 | (Museum of Modern Art, New York) |
|                  | 'The Laugh'                               | 1911 | (Museum of Modern Art, New York) |
|                  | 'Elasticity'                              | 1912 | (Reproduction)                   |
|                  | 'The Charge of the Lancers'               | 1915 | (Reproduction)                   |
| Gino Severini    | 'Dynamic Hieroglyphic of the Bal Tabarin' |      | (Reproduction)                   |

It was hoped that all slides used in the study would be originals, photographed direct from the painting. Unfortunately, it proved difficult to get original slides of Futurist work, though the galleries were located. It was possible to get two slides of Futurist work from New York, but the Italian galleries seemed particularly loath even to indicate whether slides were available. Three of the Futurist slides therefore were of necessity taken from reproductions of the paintings. These reproductions were from Copplestone (1962). The latter seemed to have reproductions which were most true to originals. This was assessed by comparing other reproductions in various books with original slides that were available.

The three slides which are reproductions are indicated on the list. Also indicated are the sources of original slides in the selection.

## B. Method

There were two conditions of viewing the slides:

### 1. Free Response Situation

Subjects were told they were to view 15 colour slides of paintings. They were told to speak freely about them; to say what they liked or disliked about them and what they suggested to them.

### 2. Comparison Situation

Six slides, two from each movement, were selected at random. These paintings were:

|                                    |               |
|------------------------------------|---------------|
| Emil Nolde 'Blumen und Wolken'     | Expressionist |
| Schmidt-Rottluff 'Houses at Night' |               |
| Georges Braque 'Violon et Cruche'  | Cubist        |
| Pablo Picasso 'Ma Jolie'           |               |
| Umberto Boccioni 'The City Rises'  | Futurist      |
| Umberto Boccioni 'Elasticity'      |               |

The same six slides were then shown to each subject in turn in every possible combination of three. This produced 20 comparison situations. Twelve situations involved a combination of two slides

from one movement, and one slide from another, rather than a slide from each movement. Subjects were instructed to write down for each combination of three in what way two paintings were alike and one was different. They were shown an example set of three slides which were not in the original group of 15, and it was suggested that two of the slides were similar in that they were representational, and one different in that it was more abstract. Subjects were asked, where possible, to compare slides using one dimension only, like representation-abstraction. Subjects were told to proceed in this way but not to use the dimension used in the example.

This method was used in order to try to derive from the subjects as many dimensions, describing paintings, as possible. The method used is analogous to the Repertory Grid method used by Kelly (1955).

### C. Expressionism, Cubism and Futurism: Development, Method and Theory

The criteria used to derive scores from the free response and comparison situations were that colour should be mentioned in relation to Expressionist, form to Cubist and movement to Futurist paintings. This was so that these scores, as well as reflecting perceptual style, should reflect "appropriate" response.

Before describing the method for deriving the scores in more detail, it is necessary to outline the rationale underlying the premise that colour, form and movement responses are appropriate to Expressionism, Cubism and Futurism respectively. To do this it is necessary to describe the history and aesthetic or theory of these schools of art, in order to show that art historians, critics and the artists themselves have maintained that these movements in art stressed colour, form and movement (or dynamic qualities) at the expense of other factors.

It should be stated from the outset, of course, that not everyone would consider it valid, or even possible, to formulate the "message" or essential qualities of a work of art. The artist, Mary Martin, for example, has embraced this view in stating (1968): "The communication which an artist makes, is slow, time-consuming and, in the first place, made for himself alone." This viewpoint, propagated by the devotees of the Platonic tradition which imbues the artist with divine, esoteric and mystical inspiration, devolves upon a view which would advocate the a priori inadmissibility of opening art to objective, systematic inquiry.

On the other hand, many artists and theorists have maintained that it is plausible to decode the means an artist chooses to express a particular set of relationships. Gillian Wise (1968) champions this view. . . "the artist should be able to be tested in an objective fashion simply as a sensitive technician or translator of media, to see whether what he understands by his work is what others understand by it. . . The sensation of comprehension itself can be part of the aesthetic response." Another artist, Abraham Moles, also believes "The work of art includes a semantic element, explicable and translatable. . ." (1968).

In so far as specific statements by artists of their aims and method are available, these can be used to define the essential elements of a painting. Conveniently, modern art divides itself into movements.



These are not just historical schemes manufactured by historians to deal with and explain modern painting. They are definable programmes of work execution. Often the artists involved in the movements published manifestos, which are lucid testimonials to their case. In order to vindicate the criteria of appropriate response in terms of colour, form and movement to Expressionism, Cubism and Futurism it is apposite to describe the aims and aesthetic underlying these movements.

In order to place Expressionism, Cubism and Futurism into perspective, it is necessary to embark on a brief historical excursion. These movements were only three of the many that flowered in the first two decades of the Twentieth Century. At the turn of the century, Impressionism had instigated a reaction against academicism and conventions in art which had been adhered to since the Renaissance. To its own method and aims Impressionism started a chain of reactions and counter-reactions and their imprint on the future development of art was as indelible as that of Manet and Monet.

Along with the rejection of past standards in art, the Impressionists instilled a desire for an art which was attuned to contemporary life, and as alive as the scenes they portrayed. These attitudes permeated the art which developed after Impressionism.

Neo Impressionism marked a reaction against the Impressionists' overconcern with the "fleeting moment" they sought to register on canvas. They turned away from the representative element in Impressionism and injected a degree of formalism into their paintings, in order to create "a higher order than a copy of nature governed by chance" (Seurat). In so doing the Neo Impressionists moved toward the idea that a painting is an autonomous entity, governed by its own rules and not a mere representation of reality.

This statement of a painting's independence was echoed by the Post Impressionists: Van Gogh, Gauguin and Cézanne. All three artists discovered the autonomous expressive power of line and colour. Van Gogh professed to feel the tension between objects and the energy they emit. This is bequeathed to later painters. As Haftmann (1968) says: "The problem of transforming the invisible formal tension between things into visible form, which worried Cézanne, and which the Futurists set out to render directly, also preoccupied Van Gogh."

Cézanne's famous dictum, "Nature must be treated in terms of the cylinder, the sphere, the cone", suggests that of all modern art movements, Cézanne sired Cubism. Yet in his emphasis on the independent qualities of form and colour and their expression independently of representative functions, Cézanne's heritage can be seen in the aesthetic of all later movements.

Taking their lead from the Post Impressionists, a group of painters produced, between 1905 and 1907, paintings which employed violent colours to produce distortion and flat patterns. Matisse and Vlaminck were two of the painters in this group. One critic, appalled by their lavish use of colour and the resulting emotional shock, called these painters "Les Fauves" or wild beasts. Haftmann (1965) characterises the Fauvists thus: "With the dynamite of their colours they had exploded nature and out



of the flames constructed their pictures according to an entirely subjective pattern." From the flames also, Expressionism was born.

In 1906 the German painter Schmidt-Rottluff declared, "To attack all revolutionary and fermenting elements: that is the purpose implied in the name Brücke." Brücke was the name of the group of painters who mark the beginning of German Expressionism. In 1910, Kirchner, Heckel, Müller and Rottluff, members of the Brücke, joined Pechstein and Nolde to form the "New Secession". They were revolting against a group of painters (The Secession) who sought to revive Impressionism.

Emil Nolde is often described as the pioneer of a natural German art, and his work contains all the elements of Expressionist painting. The Expressionists asserted the right of the artist to express his world, as he saw it. Nolde asserted "Instinct is ten times more important than knowledge." (Selz 1963).

Expressionist paintings, like Fauve, are characterised by an abandoned and full use of colour. Nolde wanted colours, he said, "with a life of their own, laughing and crying, happy and dreamy, burning and holy, like love song and eroticism, like melodies and magnificent chorales!" The aim of this passion for colour was to express emotion; "seething and foaming colours yield passion", the Brücke aesthetic maintained.

The growth of Expressionism in Germany from 1900 to 1910 paralleled that of Cubism in France. When Picasso painted "Les Femmes d'Alger" in 1907 he discarded two Renaissance rules: the diminution of objects as they recede in the distance, and the convention of linear perspective or a single unified observation point. In so doing Picasso went part of the way towards the assertion of Cubist principles. The Cubists maintained that we do not see objects in geometrical perspective; linear perspective gives an incomplete idea of objects which are three-dimensional and should be represented by angled planes. Every dimension of an object is important in the Cubist aesthetic. As Picasso said, "If a painter asked me what was the first step necessary for painting a table, I should say measure it."

A second tenet of Cubism emphasised that the perception of objects in three dimensions, and from several viewing angles, involved time. A parallel development in the scientific world at the time was Einstein's fusion of space and time as a mathematical concept. The Cubists felt that this concept was as real as perceived reality, and that naturalistic representation could not do justice to the modern mind. They wished to express an object in an eternal four dimensional space-time continuum. Just as the Expressionists escaped from realism by subjective explorations, the Cubists did so by conceptual and intellectual methods.

The phase of Cubism, ushered in by the painting "Les Femmes d'Alger" and subsuming these principles was Analytical Cubism, which lasted from 1908 till 1911.

In 1912 Gleizes and Metzinger published an exposition of Cubist doctrine: "Du Cubisme". This was a manifesto of the aims of the painters who came together in 1910; these were Gleizes, Metzinger, Le Fauconnier, Delaunay, Léger, Picasso and Braque. In 1911 Gris and Fresnaye joined them. The

Cubists strove to have the observer grasp the essence of an object intellectually. Gleizes and Metzinger said a painting "need not immediately satisfy the mind: on the contrary it should lead it, little by little, toward the imaginative depths where burns the light of organisation."

1912, when the Section d'Or was founded, marks the apogee of the Cubist movement. As the name implies, Section d'Or painters spoke of ideal measurements and proportions, and the Golden Section. In order to maximize the angled effect of form, and portray proportion and solidity, these painters minimized colour. Ozenfant and Corbusier (the "Purists") took the Cubist aesthetic a step further: "Let us leave to the clothes dyers the sensory jublations of the paint tube."

Cubism is an art dealing primarily with forms. "At bottom, they posited an ideal classically static and architectonic absolute, discerned predominantly by the intellect." (Mary Martin, 1968).

To the "weight, the gravitation of the masses, the balance of planes and volumes", (Soffici), supplied by Cubism, the Futurists in their mature stage sought to add speed.

In 1909 the Italian poet Marinetti produced a manifesto called "Le Futurisme" which, despite vehement expression of iconoclastic ideals, was in fact an echoing reinstatement of ideas expressed by the Fauvists and Impressionists. It amounted to an invective against traditional standards in art and society. Marinetti's unique contribution, inspired by the philosophy of Nietzsche and Bergson, was his idea of a constantly changing reality. He equated movement and change with life, and this he maintained, was the essence of art. He glorified the machine, racing cars and technology.

Marinetti's ideas were widely disseminated, and the Futurist art movement resulted from a meeting in Milan in 1910 between Marinetti and the painters Boccioni, Carrà and Russolo. This inspired the publication of the Futurist painting manifesto.

They wanted an art attuned to a rapidly changing society. "A racing car," they said, "is more beautiful than the Victory of Samothrace."

The Futurists aimed to enmesh the spectator in the picture, and involve him empathetically. They were influenced by the theories of Lipps, who considered the aesthetic response an aspect of empathy. This aesthetic permeated Futurist work from the beginning.

Like Cézanne, who wished to "assault and violate (nature) by exploring her to the blood and bone", the Futurists aimed to express their truth found below nature's skin: universal dynamism. The need to involve the time dimension was integral to an aesthetic which aimed to express universal movement. Cubism aimed to express an eternal timeless absolute, but Futurism sought the "blood and bone" of time itself.

To justify their restless search to capture the dynamism they considered all-permeating, the Futurists looked to psychophysics and psychophysiology. They asserted that an image is never motionless before the eyes, but "continually appears and disappears". The retinal image of a moving object is multiform: "therefore a race horse does not have four legs, it has 20 and their movements are triangular."

The Futurists wished to capture "the dynamic sensation itself made eternal" (Boccioni) but the means they used to achieve their ends were always rather vague and mixed. They rejected "the pure horizontal, the pure vertical. . . the right angle. . . the cube." They embraced "The dynamic arabesque. . . the sphere, the whirling ellipse, and all the dynamic forms which the artists genius can discover." (Carra). This employment of "dynamic forms" is a move away from the colour of Expressionism and the sculptured forms of Cubism. They said, "Our longing for truth can no longer be satisfied by traditional form and colour." The Futurists portrayed simultaneous representation of different phases of a moving object. They combined kinetic images and emphasised the lines of force and dynamic features of an object.

Futurism was the first conscious attempt to create an art that derived its forms and attitude from the Twentieth Century. From this it distilled what it felt to be the essence of its time: dynamism. As the manifesto said: "We shall exalt aggressive movement, feverish insomnia, life at the double, with somersaults, slaps and punches." Above all, they said, "We assert that the magnificence of the world has been enriched by a new beauty, the beauty of speed."

This brief survey of the history of Expressionism, Cubism and Futurism serves to place the paintings used in this study in their historical context. The use of colour as the major pivot of Expressionism is attested by Nolde. He wanted "colours that vibrate like silver and bronze bells." Gleizes upheld that "the senses deform, the intelligence forms" and he exhorted the use of line and solidity of shape to satisfy the intellect. Boccioni summarises the Futurists' central aim in aiming to make the "dynamic sensation itself, eternal."

It is maintained, therefore, that it is especially pertinent to respond to Expressionist, Cubist and Futurist works in terms of colour, form and movement, in so far as the aesthetic of these movements emphasised these facets. The outline of the aims and methods of these movements is considered a justification for using colour, form and movement responses to Expressionism, Cubism and Futurism as criteria of appropriate response. It is now apposite to describe the derivation of the measures reflecting the latter.

#### **D. Scoring — Response to Paintings**

##### **A. Free Response Score**

Responses were scored as colour form or movement determined. Any reference to colour or form, including liking for them, was scored thus. Movement was scored for any reference to moving objects or a feeling of movement, though vague references like "something is happening" were not considered movement responses.

Total number of responses to colour form and movement were tabulated. This was the colour form and movement "mentioned" score. (Results pertaining to these scores are reported in Appendix A). Responses were then scored for appropriateness. This was the "free response" score. It comprised the total

number of colour responses to Expressionist (free colour response score), form to Cubist (free form response score), and movement to Futurist (free movement response score).

### **B. Comparison Score**

Responses were again scored for the comparison condition in terms of colour form and movement. These scores were added to the number of colour form and movement responses in the free response situation to give the "mentioned" score. Responses were then scored for appropriateness. Comparison of two Futurist and one Cubist painting in terms of movement or form, for example, were considered appropriate and scored accordingly. This gave the colour, form and movement "comparison" scores.

### **C. The Percentage Score**

This score was derived as an even stronger measure of appropriateness. By mentioning colour, form and movement simultaneously in the free response situation, it would be possible to get a high appropriate response in terms of all three determinants. The percentage score was therefore derived from the free response and comparison scores (taken together) and it comprised the number of colour responses to Expressionism, for example, with the number of colour responses to Cubism and Futurism controlled. The percentage scores for form reflected form responses to Cubism, with form responses to other paintings controlled, and the movement percentage score similarly reflected movement responses to Futurism with movement responses to other paintings controlled.

## **5. OTHER SCORES**

### **A. Preference Ratings**

After each subject had given comments on each of the 15 paintings, he was asked to rate each painting on a seven-point scale. The total number of points awarded to each group of paintings was then tallied, and the score considered an indication of individual preference for a movement-Expressionism, Cubism or Futurism.

Only tentative hypotheses regarding the relationship of preference for paintings and perceptual style or personality were forwarded. It could be, as Wallen found (1948), that lack of colour responsiveness (in terms of colour shock indices) relates to dislike of colour. Hence colour responsiveness would be expected to relate to preference for Expressionism. It may be, *mutatis mutandis*, that form responsiveness would relate preference for Cubism, and movement responsiveness to preference for Futurism. The preference ratings were included, however, mainly for exploratory reasons.

### **B. Background in Art**

Each subject was interviewed and data pertinent to each of the following criteria were collected:

1. Formal art training: university, college, school.
2. Background in art of family and friends.
3. Frequency of visits to art galleries.
4. Relevant reading.
5. Other pertinent data.

From information taken from this interview seven general pictures of background in art emerged, and subjects were placed within one category:

1. Formal training in art history beyond school, course reading and visits to galleries.
2. Either formal training beyond school for a short time or reading in the field of history of art, coupled with frequent visits to art galleries.
3. Training in history of art at school; above average visits to art galleries.
4. Visits to art galleries comprising more than one a year; some reading or discussion with friends or family about art.
5. Visits to art galleries once yearly; rare discussions and reading.
6. Visits to art galleries yearly or less; no reading or discussions.
7. No visits to art galleries, reading or discussions.

Within these groups, subjects were awarded further ranks, according to extra details about art background. This enabled subjects to be ranked from 1 to 71 on art training.

Details of a subject's knowledge of art were considered of interest in relation to the measures of appropriate response. Knowledge of art could presumably be expected to relate to a measure purporting to reflect response to the most salient aspect of a painting. If this were the case, this would have to be taken into account when any results relating to perceptual style and response to paintings were reported.

### **C. Cognitive Style**

Irvin Child (1965) found that certain cognitive styles related to his measure of aesthetic judgement. As discussed in Chapter 1, Child's criterion of aesthetic judgement was the opinion, as to the better of two works of art, given by expert judges.

Questionnaire measures of six of the cognitive styles studied by Child were administered to a subsample of 16 subjects, in order to see if the scales found to relate to aesthetic judgement in Child's study also related to the measure of appropriate response to art included in this study.

The scales are described below. Child reports the reliability of the scales to be satisfactory. They range from .38 to .54 (split half reliability).

#### **1. Scanning**

High scores on this scale indicate a tendency toward broad deployment of attention, so that changes

outside the main focus of attention are noticed. Low scores indicate narrow focusing of attention so that little outside this is noticed.

Items representing this scale are:

"I am very sensitive to the emotional attitudes people sometimes want to convey but are unwilling to state openly" (Agree).

"I rarely notice the colour of people's eyes" (Disagree).

This scale significantly relates to aesthetic judgement (.29) and the coefficient is significant with art background controlled.

## 2. Sharpening

High scores on this scale indicate a tendency to react differently to stimuli which differ to a slight degree. At the opposite end of the continuum is levelling, signifying minimization of the uniqueness of experiences.

Items representing this scale are:

"Even when I am following a regular routine, I feel that each day provides a unique experience" (Agree).

"I have little or no memory of the content of the books I used in learning to read" (Disagree).

This scale did not relate significantly to aesthetic judgement though the correlation was positive.

## 3. Narrowness of Equivalence Range

This is defined as a tendency to react differently to stimuli which differ to a slight degree. Broad equivalence is a tendency to react to stimuli which are vastly different, in a similar way. This scale differs from sharpening, in so far as it is dealing with events and objects present at the same point in time, whereas sharpening refers to events spread out in time. Also, narrowness of equivalence range refers to mode of reaction to differences, whereas sharpening is more awareness of differences.

Items representing this scale are:

"Each textbook I study seems distinctive in its approach" (Agree).

"From knowing what groups a person belongs to, I feel I can get a pretty good idea of what kind of person he really is" (Disagree).

This scale showed no significant relationship with aesthetic judgement, though the correlation was positive.

## 4. Flexibility

High scores on this scale indicate ability to change mental orientation and focus of attention when conditions make it appropriate and adaptive. Rigidity, or low scores on this scale, indicates inability to



shift the main focus of attention when conditions warrant it.

Items representing this scale are:

"I find that giving attention to several different plans at once adds zest to my life" (Agree).

"I have difficulty in putting myself in the place of someone with whom I disagree and seeing things the way he does, even if it is only for argument's sake" (Disagree).

This scale showed an insignificant and negative relationship with aesthetic judgement.

## 5. Field Independence

Child derived this concept from Witkin (1962) and defined it as a tendency to maintain a set, and focus selectively despite attention-demanding irrelevant stimulation.

Items representing this scale are:

"Trying to find your way around and take a leading part in a group activity while blindfolded (as in some games) is a challenge I might well enjoy" (Agree).

"In studying mathematics, I am relatively better at remembering a proof than I am at figuring out a proof for myself" (Disagree).

This scale showed a positive, though insignificant, relationship with aesthetic judgement.

## 6. Regression in the Service of the Ego

This concept was derived from psychoanalytic theory. High scores on the scale indicate an ability to maturely regress to less mature forms of cognitive activity while the ego functions remain intact.

Items representing this scale are:

"I sometimes wonder what it would be like to do the impossible – like flying, being a member of the opposite sex, living in another era, etc" (Agree).

"The type of humour which is based on the fantastic, bizarre or impossible has little appeal for me" (Disagree).

This scale related to aesthetic judgement positively and significantly (.29). However, Regression in the Service of the Ego was related to art background, and when Child removed this effect the correlation coefficient became negligible (.20).



## CHAPTER 4

### Results

The first part of the analysis of all the measures employed in this study was the interrelation of all personality tests. This was done in order to pinpoint any overlap of 16PF and DPI scales, and to explore the possible relationship of Lüscher profiles and Rorschach ratios (which purport to reflect personality traits), with the questionnaire measures of personality traits. These results are reported first.

It was considered important to explore the interrelationship of the measures of perceptual style. To this end, all the measures reflecting perceptual style — Keehn's battery, Thurstone's test, Rorschach, the Movement Threshold Ink Blots and the measures derived from the responses to paintings — were inter-related. If uniform dimensions of colour, form and movement responsiveness exist, the measures reflecting these should correlate. This analysis also aimed to discover what overlap, if any, there was between the basic measures of perceptual style, and those also reflecting appropriate response to paintings.

The main hypotheses relating perceptual style and personality traits were tested by interrelating relevant scales from the personality tests, the basic measures of perceptual style, and colour form and movement responsiveness to paintings. Hypotheses were outlined in Chapter 2.

The next section in this chapter describes the results of analysis of preference ratings and measures of perceptual style and personality traits.

The final section discusses an analysis of the colour, form and movement scores relating to paintings, in relation to measures of knowledge of art and Child's Inventory of Cognitive Styles. This section also includes an analysis of the deviation from chance expectation of these scores in an attempt to furnish some empirical support for the contention that these scores reflect appropriate response.

#### 1. PERSONALITY MEASURES AND HYPOTHESIZED PERSONALITY DIMENSIONS: SCALE INTERCORRELATIONS AND INTERPRETATION

The personality factors measured by the four personality tests involved in this study were outlined in Chapter 3. The tests comprise the 16PF, DPI, Lüscher and Rorschach ratios. The 16PF and DPI were the two main personality tests, and results pertaining to their relation to perceptual style are reported in the section concerned with main results. The Lüscher Test, and Rorschach, were included for exploratory reasons, and results pertaining to their relation to perceptual style, though referred to in the main text, are reported in Appendices C and D.

Not all the scales included in the 16PF and DPI were relevant to the hypotheses, but all scales were administered for several reasons. Firstly, it was considered that changing the format of a questionnaire must be done cautiously, since the validity and reliability of that questionnaire depends on items given in a standard order. Secondly, DPI items often contribute to more than one scale, and hence one scale could be removed without imbalancing others. Finally, subsidiary correlations found between perceptual style

and personality variables not hypothesized were considered of interest in so far as they can elucidate the perceptual style and personality link. These subsidiary results are reported in Appendix B.

Concerning the two subsidiary personality tests: Rorschach ratios considered relevant were extracted from 20 Rorschach protocols. These are tabulated here under appropriate headings. Their relation to questionnaire scales is also outlined.

Lüscher profiles are similarly outlined in relation to the relevant personality rubric.

As outlined in Chapter 2, the perceptual styles — colour form and movement responsiveness -- are related to personality variables by the following hypotheses:

#### **Colour:**

1. Colour responsiveness is related to emotionality and impulsivity.
2. Colour responsiveness is related to extraversion.

#### **Form:**

1. Form responsiveness is related to emotional control, and non-impulsivity.
2. Form responsiveness is related to introversion.

#### **Movement:**

1. Movement responsiveness is related to emotional control and non-impulsivity.
2. Movement responsiveness is related to introversive tendencies which include
  - a. subjectivity, imaginal resources and intelligence;
  - b. introversion.

These hypotheses therefore pertain to three personality dimensions:

1. Emotionality, impulsivity — control, non-impulsivity.
2. Extraversion — introversion.
3. Subjectivity, imagination, intelligence — realism, concrete thought and limited abstract capacity.

Below is an outline of scales, Lüscher profiles, and Rorschach ratios relevant to each of these personality dimensions. Scales are considered relevant in so far as they are purported to measure one of the personality dimensions and interscale correlates corroborate this.

Scales which are not relevant to the personality dimensions under consideration are reported last. Their scale intercorrelations are also delineated in order to facilitate interpretation of subsidiary results.

#### **A. Emotionality, Impulsivity — Control, Inhibition**

Intercorrelations of the scales reported in this section are reported in Tables 1, 2 and 3, unless stated in parenthesis.

**16PF**

The following factors load the second stratum factor of anxiety:

**C Low Ego Strength — High Ego Strength \***

The negative pole of this scale represents irritability and emotionality.

C was found to relate negatively to L (16PF) protension, E (16PF) dominance, and SA (DPI) social activities.

As well as linking anxiety and tension (L), low scores on C would also seem to relate to introversion.

**L Alaxia — Protension**

L measures projected inner tension and anxiety.

It relates negatively to C (16PF) ego strength, and positively to E (16PF) dominance, and N (16PF) shrewdness, and emotional detachment.

**O Untroubled Adequacy — Guilt Proneness**

This scale represents an acting out of maladjustment, in terms of anxiety and phobias.

O was found to relate to FM + m predominance on the Rorschach ratio M : FM + m, signifying a relationship with impulsivity and drive towards immediate need gratification.

**Q<sub>3</sub> Low Self-Sentiment Integration — High Strength of Self-Sentiment**

The negative pole of this scale represents tendency to follow one's own urges and be careless of protocol.

Q<sub>3</sub> correlates positively with G (16PF) superego strength, and H (16PF) parmia, which negatively loads the second stratum anxiety factor. Q<sub>3</sub> also positively relates to M (16PF) autia suggesting that high scores on Q<sub>3</sub> relate to subjectivity and imagination.

**Q<sub>4</sub> Low Ergic Tension — High Ergic Tension**

Q<sub>4</sub> negatively relates to C (16PF) ego strength and positively to O (16PF) guilt proneness.

The following factor G does not relate to the second-stratum anxiety factor but it is the main contributor to the second-stratum factor of superego strength, along with Q<sub>3</sub> which positively loads this factor, and F which negatively loads it.

**G Low Superego Strength — High Superego Strength**

G relates conceptually to factor C (16PF) ego strength in so far as the behaviour entailed by both factors is emotionally controlled.

\* The second term always indicates the direction if high scoring.

G was found to relate positively to Q<sub>3</sub> (16PF) self-sentiment, integration, and negatively to Ov (DPI) verbal aggression. It also relates to DPI scales indicative of dependence and morality: Od dependence, C, interest in children, and H, hypocrisy.

## DPI

The following scales, according to Grygier (1969) are related to emotionality, impulsivity or control, inhibition.

### Ov Verbal Aggression

This scale is purported to reflect impulsivity and relates to Oi (DPI) impulsivity. It negatively correlates with Ac (DPI) conservatism and inhibition.

Ov also relates negatively to scales indicative of dependence and morality: Od (DPI) dependence, C (DPI) interest in children, and G (16PF) superego strength.

The positive relationship of Ov and N (16PF) shrewdness, substantiates Grygier's contention that Ov measures self-assertion.

### Oi Impulsivity

Oi negatively correlates with Ac (DIP) conservatism and inhibition. It also relates negatively to H (DPI) hypocrisy and C (DPI) interest in children.

As reported above, it relates positively to Ov (DPI) verbal aggression.

Carey (1969) found that Oi related negatively to G (16PF) superego strength ( $r = -.3 - -.39$ ).

### Ou Unconventionality

Grygier (1969) reports that low scores on this scale are indicative of inhibition and overcontrol.

Ou relates positively to Oi (DPI) impulsivity, Ov (DPI) verbal aggression, and Om (DPI) movement.

Ou also relates negatively to Ac (DPI) conservatism and inhibition.

Grygier mentions that this scale relates to confidence, and Carey (1969) found a positive relationship between Ou and E (16PF) dominance, which bears this out. However, in this study Ou was found to relate negatively to E, indicating a relation to submission.

### Ac Conservatism

Ac is purported to measure inhibition and social conformity.

The fact that Ac relates negatively to 3 oral scales (Oi, impulsivity, Ou, unconventionality and Om, movement) supports the first contention.

The relation of Ac to conformity is supported by its positive correlation with H (DPI) hypocrisy, and Od (DPI) dependence.

Table 1

## Intercorrelation of 16PF and DPI scales measuring Emotionality – Control

|                | Emotionality       |                    |                     |                     |                     | Control            |   |       |                |    |
|----------------|--------------------|--------------------|---------------------|---------------------|---------------------|--------------------|---|-------|----------------|----|
|                | L                  | O                  | Q <sup>4</sup>      | Ov                  | Oi                  | Ou                 | C | G     | Q <sup>3</sup> | Ac |
| L              |                    |                    |                     |                     |                     |                    |   |       |                |    |
| O              |                    |                    |                     |                     |                     |                    |   |       |                |    |
| Q <sub>4</sub> |                    | +.199 <sup>x</sup> |                     |                     |                     |                    |   |       |                |    |
| Oi             |                    |                    |                     | +.661 <sup>xx</sup> |                     |                    |   |       |                |    |
| Ou             |                    |                    |                     | +.374 <sup>x</sup>  | +.511 <sup>x</sup>  |                    |   |       |                |    |
| C              | -.200 <sup>x</sup> |                    | -.411 <sup>xx</sup> |                     |                     |                    |   |       |                |    |
| G              |                    |                    |                     | -.537 <sup>x</sup>  |                     |                    |   |       |                |    |
| Q <sub>3</sub> |                    |                    |                     |                     |                     |                    |   | +.202 |                |    |
| Ac             |                    |                    |                     |                     | -.740 <sup>xx</sup> | -.589 <sup>x</sup> |   |       |                |    |

x P = .05

N (16PF) = 71

xx P = .01

N (DPI) = 23

## Rorschach

The following ratios have been found in Rorschach studies to relate to emotionality and impulsivity:

## M : FM + m

M predominance is considered as an indication of control of impulsivity or drive toward immediate need gratification.

As can be seen from Table 2, this conception of M predominance is justified by its correlations with the 16PF.

M predominance relates to C (16PF) emotional control or ego strength, and negatively correlates with O (16PF) guilt, anxiety, and emotionality which is acted out rather than suffered as internal conflict.

As the chi squares indicate, therefore, FM + m predominance relates to emotionality, and impulsivity.

## FC : CF + C

FC predominance is indicative of emotional control. CF + C predominance relates to impulsivity and emotionality.

FC : CF + C revealed no relationship with 16PF measures of emotionality. Hence this Rorschach ratio, though it may measure emotionality, does not measure the same type of emotionality as questionnaire measures.

Table 2

Intercorrelation of Rorschach Ratios and 16PF

| Ratio or %   | Personality Factor | X <sup>2</sup> , or Rho |
|--------------|--------------------|-------------------------|
| M : FM + m   | O                  | 5.08                    |
|              | C                  | 5.01                    |
| M : Sum C    | E                  | 3.25                    |
|              | Q <sub>1</sub>     | 4.06                    |
| F %          | A                  | -.647 <sup>xx</sup>     |
|              | E                  | -.637 <sup>xx</sup>     |
|              | F                  | -.810 <sup>xx</sup>     |
|              | H                  | -.925 <sup>xxx</sup>    |
|              | Exvia              | -.538 <sup>xx</sup>     |
|              | Q <sub>1</sub>     | -.561 <sup>x</sup>      |
| x P = .05    | N = 71             |                         |
| xx P = .01   | d.f.= 1            |                         |
| xxx P = .001 |                    |                         |

Lüscher

*Lüscher profile 6* involves traits like sensitivity, insecurity, need for a close bond and emotional fulfilment and dependence. It is therefore included here as a subsidiary measure of emotionality. Table 3 shows that this profile, when pitted against profile 5 (ambitious, outgoing and emotionally shallow behaviour) relates to Q<sub>4</sub> (16PF) ergic tension. This supports the contention that Lüscher profile measures emotionality.

*Lüscher profile 2* reflects control of emotionality and inhibition, following such trait descriptions as "egocentric", "uninvolved". This profile was not, however, found to relate to any questionnaire measure of inhibition.

Table 3

Intercorrelation of Lüscher Profiles and 16 PF

| Profiles     | Personality Factor | X <sup>2</sup>      |
|--------------|--------------------|---------------------|
| 5:6          | Q <sub>4</sub>     | 9.139 <sup>xx</sup> |
| 5:7          | M                  | 9.88 <sup>xx</sup>  |
| x P = .05    | N = 71             |                     |
| xx P = .01   | d.f.= 1            |                     |
| xxx P = .001 |                    |                     |

## **B. Introversion — Extraversion**

The following four factors contribute to the second stratum extraversion factor, *exvia*. Inter-correlations are reported in Tables 2, 3, and 4.

### **A Sizothymia — Affectothymia**

A was found to relate positively to F (16PF) surgency, and M (DPI) masculinity.

A also related negatively to Rorschach F % which is supposed, among other things, to indicate social withdrawal.

### **E Submission — Dominance**

Factor E, like A, also related positively to F (16PF) surgency and negatively to Rorschach F %, withdrawal.

E also negatively related however to factor C (16PF) ego strength, and positively to L (16PF) protension, which suggests that E bears some relation to anxiety and emotionality.

E also related positively to Ai (DPI) anal insularity and racial prejudice. The exact meaning of this relationship is unclear, but it would certainly seem, in the light of the above correlations, that to interpret factor E as a major factor in extraversion, without qualification, is specious.

### **F Desurgency — Surgency**

This factor relates positively to four other scales measuring extraversion: A (16PF) affectothymia, E (16PF) dominance, H (16PF) pammia, and Pe (DPI) exhibitionism. Like A, and E, F also related negatively to Rorschach F %, withdrawal.

F also correlated positively with B (16PF) intelligence.

## **Q<sub>2</sub> Group-Dependence — Self-Sufficiency**

Low scores on Q<sub>2</sub> reflect a facet of extraversion — group dependence.

Q<sub>2</sub> did not relate to other measures of extraversion (it would be expected to correlate negatively with A E F and H). It did relate to Q<sub>1</sub> (16PF) radicalism, however, which suggests that Q<sub>2</sub> relates to independence of thought as well as independence of action.

## **DPI**

The following scales measure extraversion — introversion.

### **Pe Exhibitionism**

Pe bears no relation to the other phallic scales, which are not in fact directly relevant to extraversion,



according to Grygier's account of these scales.

Pe relates to three measures of extraversion on the 16PF: F, surgency, H, parrnia, and the second stratum factor of exvia.

Carey (1969) found that Pe related to H and A ( $r = +.4 - +.49$ ) and F and E ( $r = +.3 - +.39$ ).

Pe also related to F (DPI) femininity and CI (DPI) creative interests.

#### El Initiative

Grygier states that low scores on El reflect shyness.

El relates to SA (DPI) social interests and A (16PF) affectothymia.

Carey (1969) also found a relationship between El and A (16PF) ( $r = +.3 - +.39$ ).

Grygier also suggests that El relates to intelligence; this was supported: El positively correlated with B (16PF) intelligence.

#### SA Social Activities

SA relates negatively to  $Q_2$  (16PF) self-sufficiency and, therefore, bears a relation to group-dependence, in so far as it reflects interest in social or group activities.

SA also related negatively to Ai (DPI) racial prejudice and Ws (DPI) seclusion.

A positive correlation was also found between SA, and C (16PF) ego strength.

#### WS Womb Seclusion

This scale reflects social introversion as a defence against social anxiety. Ws was found to relate negatively to SA (DPI) social activities.

Table 4

Intercorrelation of scales measuring Extraversion — Introversion

|       | Extraversion |      |                    |      |      | Introversion       |       |    |
|-------|--------------|------|--------------------|------|------|--------------------|-------|----|
|       | A            | E    | F                  | Pe   | El   | SA                 | $Q_2$ | Ws |
| A     |              |      |                    |      |      |                    |       |    |
| E     |              |      |                    |      |      |                    |       |    |
| F     | +208         | +225 |                    |      |      |                    |       |    |
| Pe    |              |      | +574 <sup>xx</sup> |      |      |                    |       |    |
| El    | +474         |      |                    |      |      |                    |       |    |
| SA    | +474         |      |                    | +399 | +401 |                    |       |    |
| $Q_2$ |              |      |                    |      |      | -396               |       |    |
| Ws    |              |      |                    |      |      | -561 <sup>xx</sup> |       |    |

x P = .05

N (16PF sample) = 71

xx P = .01

N (DPI sample) = 23

## Lüscher

*Lüscher profile 1* reflects social introversion. Traits involved include “prefers comfort to ambition”, “feels cut off from harmony and co-operation.”

*Lüscher profile 3* measures extraversion, or group dependence, following such trait descriptions as “intensely involved in life”, and “works well in a group, not a leader.”

*Lüscher profile 4* reflects social extraversion involving traits such as “readily participant” and “wide activities”.

*Lüscher profile 5* reflects outgoing ambitious behaviour.

None of these profiles was found to relate to questionnaire measures of extraversion (see Table 3 above).

## C. Subjectivity, Imagination, Intelligence – Realism Concrete Thought, Low Abstract Capacity

The 6th second-stratum factor extracted by Cattell (1970) from factor analysis of the primary source traits was Cool Realism – Prodigious Subjectivity, and it is loaded by L – I + and M +. This factor is not, as yet, characterised by any criterion associations, but it seems to involve traits like introspection, subjectivity, fantasy and resources of imaginal functions.

I and M also load the second-stratum factor of Pathemia-Cortertia, and this means that high scores on I and M are indicative of the tendency to “feel” rather than “think”, or be interested in handling problems at a “dry” cognitive, or objective level” (Cattell 1970).

It would therefore seem feasible to suggest that M and I measure something in common with Rorschach’s concept of “introversive” tendencies, which involves easy access to imaginal functions, and abstract thought capacity.

The following scales are therefore considered representative of personality dimension 3.

### I Harria – Premsia

High scores on I not only indicate sensitivity and insecurity, but also signify imaginative inner life and sensitive intuition.

I correlates with Q<sub>4</sub> (16PF) ergic tension and therefore bears some relation to anxiety.

I also relates to Pe (DPI) exhibitionism, the second-order factor, exvia (16PF), and negatively correlates with N (16PF) shrewdness. It may therefore bear some relation to extraversion.

### M Praxernia – Autia

Autia means absorption in inner creations, and M is purported to relate to creative interests and pursuits, though it was not found to relate to CI or TI (DPI) which measure the latter.

M was found to positively correlate with Q<sub>1</sub> (16PF) radicalism, and experimental thought, and Q<sub>3</sub>

(16PF) strength of self-sentiment, and stability.

A positive relationship was found between M and preponderance of M in the M : Sum C Rorschach ratio, which goes a long way towards justifying the consignment of M to the realm of introversive tendencies.

M also relates to aesthetic sensitivity as measured by Lüscher profile 7.

## B Intelligence

Since introversive tendencies as reflected by M production on Rorschach involve capacity for abstract thought, B, intelligence, is directly relevant to the hypothesis concerning introversive tendencies.

B is a primary source trait and also emerges as a second-order factor of intelligence.

B was found to positively correlate with 2 DPI scales indicative of creative interest, CI creative interests, and TI tactile interests.

## DPI

The following scales are relevant to the personality dimension involving the introversive tendencies of imagination, intelligence and subjectivity in so far as they reflect creative interests, and purport to relate to imagination (Grygier 1969).

## CI Creative Interests

Grygier (1969) suggests this scale reflects intelligence, and CI was in fact found to relate to B (16PF) intelligence.

CI related positively to Pe (DPI) exhibitionism, and therefore relates to some extent to extraversion. This too is in line with Grygier's contention that low scores on CI reflect introversion.

CI was also found to relate to F (DPI) femininity.

## TI Tactile Interests

Like CI, with which it correlates, TI relates to B (16PF) intelligence.

TI relates negatively to A (16PF) affectothymia, and may reflect a degree of introversion.

Table 5

Intercorrelation of scales measuring Intelligence, Imagination and Creative Interests

|           | I | M          | B    | TI                   | CI |
|-----------|---|------------|------|----------------------|----|
| I         |   |            |      |                      |    |
| M         |   |            |      |                      |    |
| B         |   |            |      |                      |    |
| TI        |   |            | .418 |                      |    |
| CI        |   |            | .425 | .555xx               |    |
| x P = .05 |   | xx P = .01 |      | N (16PF sample) = 71 |    |
|           |   |            |      | N (DPI sample) = 23  |    |

## Rorschach

### M : Sum C

M predominance on this ratio is indicative of the introversive tendencies of imagination and intelligence, as well as social introversion. It could, therefore, have been included in the previous section under the extraversion-introversion rubric. However since M : Sum C is relevant only to a hypothesis linking imagination, intelligence and social introversion, it can be hypothesized only in relation to movement responsiveness.

M predominance was found to relate to Q<sub>1</sub> (16PF) experimental thought or radicalism, which is akin to the concept of introversive traits.

C predominance related to E (16PF) dominance, and extraversion.

Support is therefore forthcoming for both aspects of the introversive trait hypothesis relating to the M : Sum C ratio (see Table 2, above).

## Lüscher

Lüscher profile 7 involves the trait of aesthetic sensitivity, and imagination. When this profile was pitted against profiles which did not involve the trait aesthetic sensitivity in particular profiles, it was found to relate to M (16PF) autia (see Table 3 above). This is in line with the traits which profile 7 purports to measure.

## D. Subsidiary Scales

The following scales were not included under any of the hypothesized personality dimensions either because they were irrelevant or because they measured traits representative of more than one dimension. H (16PF) parrnia, for example, measures both extraversion and stability, loading positively the second-order factor exvia, and negatively the second order anxiety factor. Hence H could not be hypothesized in relation to colour or form as the hypotheses relating to these involve respectively extraversion and instability, and introversion and stability.

Intercorrelations for subsidiary scales are reported in order to facilitate interpretation of subsidiary results reported in Appendix B. Correlations are reported in parenthesis. All are significant (P .05).

## 16PF

### H Threctia — Parrnia

H loads both extraversion and anxiety as outlined above.

It was found to relate to two factors indicative of extraversion: F (16PF) surgency (+ .487), and Pe (DPI) (+ .472) exhibitionism.

H also related to Q<sub>3</sub> (16PF) (+ .268) self-sentiment integration. It related negatively to Q<sub>4</sub> (16PF) (- .249) ergic tension and O (16PF) (- .200) guilt-proneness. These intercorrelations reflect the relation of H and stability.

#### N. Naivete — Shrewdness

This factor emerges as the sole representative of the second-order factor, shrewdness.

N may possibly relate to unconventionality and impulsivity, in so far as it positively correlates with Ov (DPI) (+ .487) verbal aggression, and S (DPI) (+ .536) sexuality. It relates negatively to H (DPI) (- .657) hypocrisy, C (DPI) (- .406) interest in children and As (DPI) anal sadism (- .603).

N cannot be said to be biased toward extraversion or introversion in so far as it relates positively to H (16PF) (+ .196) parrnia, and negatively to E (16PF) (- .246) dominance and both scales measure extraversion.

#### Q<sub>1</sub> Conservatism — Radicalism

Q<sub>1</sub> indicates experimental, analytical thought. Along with E, L, M, and Q<sub>2</sub> this factor positively loads the second-stratum factor subduedness-independence. Cattell (1970) also remarks that Witkin's celebrated concept of field independence (1962) is probably an expression of this factor.

Q<sub>1</sub> relates positively to Q<sub>2</sub> (16PF) (+ .339) independence and self-sufficiency. It relates negatively also to Rorschach F % (- .501), withdrawal, so cannot be said to be biased towards extraversion or introversion.

That Q<sub>1</sub> may relate to introversive tendencies (imagination, intelligence, and to some extent, introversion) is suggested by its positive correlation with M predominance on the Rorschach M : Sum C ratio ( $x^2 = 4.06$ ).

#### DPI

#### O Orality

Though O is purported to reflect impulsivity (Grygier 1969) it was not found to relate to any other oral scale except OA (+ .432) oral aggression, and hence does not relate to the oral scales which directly measure impulsivity (Oi, Ov and Ou). For this reason O was excluded from the group of scales hypothesized in relation to impulsivity.

O was found to relate to emotionality as measured by two 16PF scales: it related positively to Q<sub>4</sub> ergic tension (+ .434), and negatively to C, ego strength (- .587) to some extent, therefore O can be said to reflect emotionality.

## OA Oral Aggression

OA did not relate to any other oral scales, except O orality. Since these two scales are supposed to reflect traits (liking for savoury and sweet foods respectively) from which the other oral traits derive (impulsivity, dependence, unconventionality) the fact that they do not relate to Oi, Ov, Od or Ou does not augur well for Freudian theory. The isolated correlation of O and OA suggests only that one type of oral gratification relates to another. Since orality and oral gratification did not, as expected, relate to other oral scales and therefore do not seem to permeate their hypothesized trait derivatives, they were excluded from the main analysis.

OA was found to bear a relation to creative pursuits and intelligence, in so far as it related positively to CI (DPI) creative interests (+ .434), TI (DPI) tactile interests (+ .538) and B (16PF) intelligence (+ .474).

## Od Dependence

Od is purported to reflect conformity and dependence on other directed judgements.

In line with this, Od was found to relate negatively to Q<sub>2</sub> (16PF) (- .490) self-sufficiency, and positively to Ac (+ .466) (DPI) conservatism, G (16PF) superego strength (+ .473) and F (DPI) femininity (+ .640).

Od did not relate to the other oral scales, and in fact negatively related to Om (DPI) (-.545) movement and Ov (DPI) verbal aggression (- .537).

Od would seem to relate to realism, and concrete thought in so far as it relates negatively to M (16PF) autia (- .453).

## Om Movement

This scale reflects independence and need for freedom of movement.

That it reflects a degree of impulsivity is indicated by its positive relation to Ov (DPI) verbal aggression (+ .402), Ou (DPI) (+ .533) unconventionality, and its negative relation to Ac (DPI) conservatism and inhibition (- .594).

Om also related negatively to H (DPI) hypocrisy (- .622) and C (DPI) interest in children (- .646).

## Ah Hoarding

Ah was found to relate positively to O (DPI) orality (+ .431). Grygier's (1969) contention that Ah relates negatively to ego strength, or stability, is therefore supported, to some extent.

## Ad Detail

This scale relates to three other anal scales. Aa authority (+ .472), As sadism (+ .448), and Ac conservatism (+ .422). It relates negatively to Ou (DPI) (- .630) unconventionality, and therefore relates to inhibition to some extent.

That Ad relates to self-confidence is suggested in so far as it relates to Q<sub>2</sub> (16PF) self-sufficiency (+ .430) and E (16PF) dominance (+ .471).

Carey (1969) also found a relation between Ad and G (16PF) super-ego strength ( $r = + .5 - + .59$ ).

#### **Aa Authority**

The scale intercorrelations of Aa are similar to those of Ad. It relates positively to As (DPI) sadism (+ .695), Ac (DPI) (+ .479) conservatism and inhibition, and Ad (DPI) detail (+ .472). Aa relates negatively to Ou (DPI) unconventionality (- .783) and Om (DPI) movement (- .416).

Aa too relates to E (16PF) dominance (+ .437) and H (DPI) hypocrisy (+ .645).

A positive correlation was found between Aa and G (16PF) superego strength (+ .531); Carey (1969) found a correlation of + .3 - + .39 for G and Aa.

Aa may be considered to some extent a measure of control and inhibition.

#### **As Sadism**

Again the scale intercorrelations for As and Aa and Ad are similar.

As relates to Aa (DPI) authority (+ .695), and Ad (DPI) detail (+ .448). It relates negatively to Ou (DPI) unconventionality (- .736).

As also relates positively to H (DPI) hypocrisy (+ .590), G (16PF) superego strength (+ .389) and Q<sub>2</sub> (16PF) self-sufficiency (+ .461).

To some extent As like Aa and Ad, reflects inhibition and control of impulsivity.

#### **Ai Insularity**

This scale measures racial prejudice, and showed no relation to the other anal scales.

It related to E (16PF) dominance (+ .523) and negatively correlated with SA (DPI) social activities (- .470).

These contradictory correlations of Ai with two measures of extraversion make interpretation of this scale particularly difficult. It cannot be said to relate introversion or extraversion.

#### **P Phallic**

P is purported to relate to extraversion but was found to relate negatively to H (16PF) paranoia (- .402).

The only other correlation P showed was with Pf (DPI) fire (+ .559).

#### **Pf Fire**

This scale was reported to measure intelligence and extraversion (Grygier 1969).



Pf did not relate to intelligence; it negatively correlated with B (16PF) intelligence (- .462) and M (16PF) autia (- .406). It also related negatively to the second-order factor exvia (- .410). Hence the main traits attributed to Pf were not substantiated by interscale correlations.

Pf also negatively related to I (16PF) premsia (- .545), which again contradicts Grygier's assertion that Pf relates to sensitivity.

#### **Pn Narcissism**

Pn did not relate to any other phallic scale except Ph (+ .420), height, indicative of passive aspects of the Icaran complex or fantasy aspects of achievement drive.

Pn also related positively to G (16PF) superego strength (+ .588) and F (DPI) femininity (+ .480).

#### **Pa Achievement**

Pa related to M (DPI) masculinity (+ .467) and Pi (DPI) Icaran exploits (+ .704). It also related to Ws (DPI) seclusion (+ .414).

#### **Pi Icaran Exploits**

Pi related to achievement needs and active exploits as reflected by Pa (DPI) (+ .704). It related also to M (DPI) masculinity (+ .540), Ws (DPI) seclusion (+ .416) and FcP (DPI) persistence (+ .455).

#### **Ph Height**

This scale reflects passive aspects of the Icaran complex.

It was found to relate to G (16PF) superego strength (+ .588), Pn (DPI) narcissism (+ .420), and Aa (DPI) authority (+ .416).

#### **EP Persistence**

This scale measuring renewal of effort in the face of difficulties was not hypothesized in relation to any of the perceptual variables.

It related negatively to Q<sub>1</sub> (16PF) (- .623) experimental thought, CI (DPI) creative interests (- .415) and SA (DPI) social activities (- .448).

#### **C Interest in Children**

Grygier's contention that C relates to stability and lack of neurotic traits was confirmed by scale intercorrelations, in so far as C related negatively to Ov (DPI) verbal aggression (- .708) and Oi (DPI) impulsivity, (- .549). C also related to H (DPI) hypocrisy (+ .612), F (DPI) femininity (+ .456) and G (16PF) superego strength (+ .709).

C may be considered as reflective of stability and inhibition to a degree.

## **H Hypocrisy**

Social conformity, as measured by this scale, is reflected in so far as it relates to C (DPI) interest in children (+ .612) and G (16PF) superego strength (+ .457). Carey (1969) also found that H correlated with G ( $r = +.4 - +.49$ ). That H reflects inhibition and emotional control is suggested by its positive correlations with the DPI scales As sadism (+ .590), As authority (+ .645), Ad detail (+ .360) and Ac conservatism and inhibition (+ .572). H negatively relates to Om movement (- .662), Ou unconventionality (- .749), Ov verbal aggression (- .634), and Oi impulsivity (- .656).

## **S Sexuality**

Interscale correlations reveal S to be the converse of H (DPI) hypocrisy.

S relates to scales indicative of impulsivity on the DPI : Oi, impulsivity (+ .509), Ov verbal aggression (+ .495), Om movement (+ .589) and Ou unconventionality (+ .757). It relates negatively to anal scales As sadism (- .686), Aa authority (- .580), Ad detail (- .308), and Ac conservatism (- .596).

A positive correlation was found between S and N (16PF) shrewdness (+ .536).

## **M Masculinity**

This scale was not relevant to any hypotheses. It related to Q<sub>2</sub> (16PF) independence (+ .538), A (16PF) affectothymia (+ .592), EI (DPI) initiative (+ .530), Pi (DPI) Icaran exploits, (+ .540). M also negatively related to Pn narcissism (- .506), Od, dependence (- .420), and C, interest in children (- .471).

## **F Femininity**

F related to I (16PF) sensitivity (+ .501), Od (DPI) dependence (+ .640) and G (DPI) superego strength (+ .584). The latter correlation conflicts with Carey's finding that G related positively to M (DPI) masculinity ( $r = +.3 - +.39$ ).

## **Rorschach**

### **F %**

This percentage indicates emotional inhibition, imaginal constriction, and stripping of personal components from experience. Hence F % is purported to measure three types of constriction: emotional, imaginal and social. The many facets of F % interpretation means that it is difficult to hypothesize in relation to perceptual variables. Also, interpretation of F % must proceed with caution, since it should be interpreted relative to form level, on an individual Rorschach protocol (see Glossary, Appendix F for a short account of form levels, or F + and F -).

Hence, any relation found between F % and perceptual style was consigned to subsidiary results, in Appendix B.

F % was found to relate to introversion: it related negatively to A (16PF) affectothymia (- .647), E (16PF) dominance (- .637) surgency (- .810), and H (16PF) parmia (- .925).

F % also related negatively to Q<sub>1</sub> (16PF) experimental analytical thought, or radicalism (- .501).

Hence the contention that F % relates to introversion, and imaginal construction is borne out by these findings.

## 2. INTERRELATION OF MEASURES OF COLOUR, FORM AND MOVEMENT RESPONSIVENESS

This section comprises a report of intercorrelations of tests of perceptual style (Rorschach, the Keehn battery, Thurstone's test, and Movement Threshold Ink Blots) with each other, and with the scores reflecting colour, form and movement responsiveness to paintings. It precedes the report of results pertaining to hypotheses linking colour form and movement responsiveness to personality, because unless there is some evidence suggesting fairly unitary dimensions of colour form and movement responsiveness common to all test situations, any attempt to link these dimensions with personality variables would seem rather futile.

As there were various measures of colour — form dominance (Thurstone's film, and the Keehn battery) results pertaining to the interrelation of these tests are reported first. The interrelations of the various scores reflecting colour form and movement responsiveness to painting are then reported. The final part of this section consists of results concerning the relation of Rorschach to colour — form dominance and movement threshold, and the relation of these scores to colour form and movement responsiveness to paintings.

### A. Interrelation of Colour-Form Dominance Tests:

Six tests, comprising the Keehn battery, were administered to the whole sample of 71 people. The Thurstone colour-form test was administered to 34 people.

The percentage of colour responders on the Keehn battery is reported in Table 6. The tests did not, as was hoped, consistently discriminate between colour and form dominance, as for instance that 50% of subjects were colour-dominant. The percentage of colour responders on all six tests was 39. Moreover, as can be seen from Table 7, the percentage of colour responders found by Keehn, and the percentage found in this study, differ markedly.

Table 6

Number and Percentage of Colour and Form Responders on Keehn Tests 1-5 and Keehn Test 1

|             | Colour Dominant |       | Form Dominant |       |
|-------------|-----------------|-------|---------------|-------|
|             | Number          | %     | Number        | %     |
| Tests 1 - 5 | 30              | 42.23 | 41            | 57.75 |
| Test 1      | 37              | 52    | 34            | 48    |

N = 71

Table 7

## Percentage Colour Responders on the Keehn Colour-Form Dominance Test Battery

| Colour Form Test    | 1  | 2  | 3    | 4    | 5  | 6    | All Tests |
|---------------------|----|----|------|------|----|------|-----------|
| % Colour Responders | 52 | 41 | 60.5 | 34   | 31 | 15.5 |           |
| % Found by Keehn    | 60 | 35 | 38   | 42.5 | *  | *    |           |

Key 1. Stepping Stones \*not reported

2. Common Elements

3. Odd One Out

4. Grouping

5. Hidden Letter

6. Hidden Number

Test 6 of the Keehn battery discriminated only 15.5% colour responders, and did not correlate with any other colour-form test in the battery. It was therefore excluded from further analysis. Of the remaining five tests, which together gave 42.5% colour responders, colour dominance on three or more of the tests was considered indicative of colour dominance. This dichotomous classification of colour-form dominance was analysed in relation to Thurstone's test, Rorschach measures of colour and form responsiveness, and three personality tests: the 16PF, Rorschach ratios, and the Lüscher. Since subjects could score as colour-dominant on one to five of the tests, ranks were also assigned for colour-dominance to those subjects (23) who completed the DPI. Rank correlation coefficients were carried out for this sample.

Test 1 of the Keehn battery gave 52% colour responders, and correlated with three other tests in the battery — tests 2, 3 and 4 (see Table 8). There were no other test intercorrelations. Test 1 was also taken as a measure of colour-form dominance.

Table 8

## Interrelation (Kolmogorov-Smirnov) of the Keehn Colour Form Dominance Test Battery

| Test | 1 | 2       | 3      | 4      | 5 | 6 |
|------|---|---------|--------|--------|---|---|
| 1    |   | 8.103xx | 4.978x | 5.286x |   |   |

Scores on the Thurstone colour-form film are not dichotomous. Subjects vary in degree of colour responsiveness, and colour and form responsiveness are scored separately. Thurstone (1952) states that a high colour score tends to be associated with a low form score but they do not represent a simple bipolarity. Colour and form scores for the sample were correlated, and since a negative, and highly significant, correlation emerged for colour and form dominance scores only one set of scores, those for colour dominance,

were related to the Keehn battery, and personality variables. Low scores on the colour dominance continuum were regarded as indicative of form dominance.

There were therefore three scores reflecting colour-form dominance. Test 1 of the Keehn battery, tests 1 to 5 of the Keehn battery, and the Thurstone score of colour dominance.

Table 12 (below, section E) shows the intercorrelation of these scores.

Test 1 of the Keehn battery correlated with the Thurstone test at a level which approximated significance ( $\chi^2 = 4.25$  P .05). Tests 1 – 5 of the Keehn battery related to Thurstone's measure of colour dominance in the predicted direction and beyond the P = .05 level of significance. This correlation is interpreted as evidence for a unitary colour-form dimension underlying the colour-form tests.

Keehn (1953) factor analysed a large battery of colour-form tests, and found a general colour-form factor. His battery did not include the Thurstone test. This result lends further support to the hypothesis that tests of colour-form dominance measure a uniform colour-form dimension.

It is feasible, therefore, in reporting results pertaining to colour-form dominance to include both Thurstone's test and the Keehn battery as coequal indices of an underlying colour-form dimension.

**B. Interrelation of measures of colour, form and movement responsiveness to paintings**

Three scores were calculated for colour, form and movement responsiveness to paintings. From the total number of colour, form and movement responses to all paintings, the number of colour-form and movement to Expressionist, Cubist and Futurist paintings respectively were calculated for two situations: a situation in which the subject spoke freely about the paintings, and a situation in which the subject compared groups of three paintings. These comprised the free response, and comparison scores. The third score was a percentage score. It was calculated, because, though the free response and comparison scores reflected "appropriate" reactivity to Expressionism, Cubism and Futurism, they did not reflect responsiveness, which could not be achieved on a "hit and miss" basis. A subject, for example, could score highly on the free colour response score, and hence be considered as responding "appropriately" to Expressionism, but he might well have reacted equally in terms of colour, to all paintings as well as Expressionist. The percentage score, therefore, reflects appropriate colour responsiveness regardless of how many general and indiscriminate colour responses were given.

Tables 9, 10 and 11 represent the interrelation of the different scores for colour, form and movement responsiveness.

**Table 9**  
**Intercorrelations (Product Moment) for Colour Responsiveness to Painting Scores**

|               | Comparison          | Free Response        | % |
|---------------|---------------------|----------------------|---|
| Comparison    |                     |                      |   |
| Free Response | + .206 <sup>x</sup> |                      |   |
| %             | + .138              | + .362 <sup>xx</sup> |   |
| x P = .05     |                     | N = 71               |   |
| xx P = .01    |                     |                      |   |

Table 10

## Intercorrelations (Product Moment) for Form Responsiveness to Painting Scores

|               | Comparison          | Free Response        | % |
|---------------|---------------------|----------------------|---|
| Comparison    |                     |                      |   |
| Free Response | + .018              |                      |   |
| %             | + .271 <sup>x</sup> | + .509 <sup>xx</sup> |   |
|               | x P = .05           | N = 71               |   |
|               | xx P = .01          |                      |   |

Table 11

## Intercorrelations (Product Moment) for Movement Responsiveness to Painting Scores

|               | Comparison          | Free Response        | % |
|---------------|---------------------|----------------------|---|
| Comparison    |                     |                      |   |
| Free Response | + .019              |                      |   |
| %             | + .239 <sup>x</sup> | + .543 <sup>xx</sup> |   |
|               | x P = .05           | N = 71               |   |
|               | xx P = .01          |                      |   |

The percentage score consistently relates to the free response and comparison scores. All are positive, for colour form and movement, with the exception of that between the colour percentage score and the colour comparison score, which, although in the predicted direction does not attain significance. The percentages were derived from the free response and comparison scores, and hence these positive correlations are to be expected.

The intercorrelations for the comparison and free response scores give little evidence for general colour, form and movement dimensions underlying responses to paintings. The correlations for the free form and movement response and comparison scores are insignificant, and the free colour response and comparison scores relate at a level which just attains significance, (.05).

Hence, it would seem, that tendency to respond to paintings in terms of colour, form or movement in one context does not necessarily relate to this propensity in another context. There is no evidence for a unitary dimension underlying form or movement responsiveness to paintings, and the evidence for colour is tentative.

### C. Rorschach Measures of Colour, Form and Movement Responsiveness in relation to Colour-Form Dominance and Movement Threshold

Studies pertaining to the interrelation of Rorschach measures of colour and form responsiveness and colour-form dominance were reported above (Chapter 2). Oeser (1932) and Schwarz (1941) related

measures of colour-form dominance to Rorschach. They found positive correlations, but no significances were reported. Keehn (1953) and Thurstone (1944) factor analysed a battery of colour-form tests, including Rorschach and concluded that colour-form dominance and Rorschach colour and form responsiveness were independent dimension. Results from this study, reported below, lend support to the conclusions of Keehn and Thurstone.

The Thurstone test of colour-form dominance could not be related to Rorschach since the tests were given to separate subsamples which barely overlapped.

Tables 12 and 13 (see Section E) show that colour-form dominance as measured by test 1 of the Keehn battery, and tests 1 to 5 did not relate to Rorschach CF and C, or Rorschach F responses. It would seem that colour-form dominance, or colour and form responsiveness as measured in tests specifically designed to measure these perceptual styles, and colour and form responsiveness on Rorschach are independent dimensions.

In relation to movement responsiveness, it was noted above (Chapter 2) that no study had related Rorschach movement responsiveness to measures of movement threshold, but since the latter was measured by blots specifically designed to elicit that reflected by Rorschach M — propensity to see human movement in ambiguous stimuli — there were strong a priori reasons for assuming a link.

This study furnishes empirical evidence for this assumption. Low movement threshold, or facility to see movement in the Barron ink blots relates to movement responsiveness on Rorschach. The correlation was positive, and significant (Table 14, Section E). Hence, both Rorschach M and movement threshold would seem to reflect a propensity to attribute movement to a static configuration, and this reflects a unitary underlying dimension.

In summary, results bearing upon the relationship of Rorschach measures of colour and form responsiveness and tests of colour-form dominance are in line with previous findings. Colour and form dominance, and Rorschach colour and form responsiveness, are independent dimensions.

The assumed relationship of Rorschach movement responsiveness and movement threshold has not been subjected to experimental tests before. This study suggests they reflect a unitary dimension.

#### **D. Interrelation of Rorschach Colour, Form and Movement Responsiveness, and Colour, Form and Movement Responsiveness to Paintings**

Results pertaining to the interrelation of Rorschach and responses to paintings are reported below in Section E (Tables 12, 13 and 14). Colour responsiveness on Rorschach (CF and C responses) did not relate to any score reflecting such responsiveness to paintings.

Form responsiveness on Rorschach (F responses) relates significantly and positively to form comparison scores.

Movement responsiveness on Rorschach (M responses) relates to movement comparison scores.

It would seem that tendency to respond to Rorschach in terms of form and movement relates to



tendency to respond to paintings, when comparing them, in terms of form and movement. The comparison score, as was reported earlier, bears no relation to the free response score. It would seem then, that form and movement responsiveness on Rorschach has more in common with tendency to compare paintings in these terms than with response to paintings in terms of form and movement in a free response situation.

#### E. Colour-Form Dominance and Movement Threshold in relation to Paintings

Colour responsiveness on Rorschach was not found to relate to any measure of colour responsiveness to paintings, though form responsiveness and movement responsiveness on Rorschach looks related to comparison scores. Conversely, colour dominance, on the Keehn Battery (tests 1 – 5) related to the colour comparison score (see Table 12), whereas form dominance did not.

Low movement threshold was also found to relate to propensity to compare Futurist paintings in terms of movement – the movement comparison score (Table 14).

Table 12

#### Intercorrelations of Measures of Colour Responsiveness

| Score         | Keehn 1<br>D or $x^2$ | Keehn 1-5<br>D or $x^2$ | Thurstone<br>Rho | Rorschach<br>CF + C<br>Rho |
|---------------|-----------------------|-------------------------|------------------|----------------------------|
| Keehn 1       |                       |                         |                  |                            |
| Keehn 1-5     |                       |                         |                  |                            |
| Thurstone     | 4.25 <sup>x</sup>     | 4.45 <sup>x</sup>       |                  |                            |
| Rorschach     | .277                  | .054                    | +                |                            |
| Comparison    | .217                  | 6.278 <sup>x</sup>      | + .059           | - .196                     |
| Free Response | .171                  | .053                    | - .048           | + .195                     |
| %             | .110                  | .098                    | + .047           | - .229                     |

<sup>x</sup> P = .05 (one tail)

+ Thurstone and Rorschach could not be intercorrelated because they were given to different subsamples.

Table 13

#### Intercorrelations of Measures of Form Responsiveness

| Test      | Keehn 1<br>D or $x^2$ | Keehn 1-5<br>D or $x^2$ | Thurstone<br>Rho | Rorschach<br>F<br>Rho |
|-----------|-----------------------|-------------------------|------------------|-----------------------|
| Keehn 1   |                       |                         |                  |                       |
| Keehn 1-5 |                       |                         |                  |                       |
| Thurstone | 4.25 <sup>x</sup>     | 4.45 <sup>x</sup>       |                  |                       |

| Test          | Keehn 1<br>D or $x^2$ | Keehn 1-5<br>D or $x^2$ | Thurstone<br>Rho | Rorschach<br>F<br>Rho |
|---------------|-----------------------|-------------------------|------------------|-----------------------|
| Rorschach     | .156                  | .054                    | +                |                       |
| Comparison    | .054                  | .114                    | + .101           | + .435 <sup>x</sup>   |
| Free Response | .220                  | .174                    | + .053           | - .124                |
| %             | .213                  | .063                    | + .147           | - .084                |

<sup>x</sup>  $P = .05$  (one tail for  $x^2$ )

+ Thurstone and Rorschach could not be intercorrelated as they were given to different subsamples.

Table 14

#### Intercorrelations of Measures of Movement Responsiveness

| Score              | Movement Threshold   | Rorschach M         |
|--------------------|----------------------|---------------------|
| Movement Threshold |                      |                     |
| Rorschach          | + .375 <sup>x</sup>  |                     |
| Comparison +       | - .262 <sup>xx</sup> | + .491 <sup>x</sup> |
| Free Response +    | + .038               | + .120              |
| % +                | + .056               | + .101              |

<sup>x</sup>  $P = .05$

+ Correlations for these scores and Movement Threshold were Product Moment. The other correlations are Rank Difference.

This product moment correlation is in the predicted direction (negative) since low movement threshold is reflected in a low score.

#### F. Conclusion

The question of whether there are dimensions of colour form and movement responsiveness underlying different measures of these evokes different answers for colour, form and movement. Colour and form responsiveness tend to be specific in their expression and to vary from one test to another, whereas movement responsiveness seems to be a more or less unitary dimension underlying responsiveness to different stimuli.

Rorschach and colour-form dominance tests measure different things. Tests of colour-form dominance do not relate to either colour or form responses on Rorschach.

Colour responsiveness when comparing Expressionist paintings bears a relation to colour dominance, whereas form responsiveness to Cubist paintings in a comparison situation relates to form responsiveness on Rorschach. Neither form dominance (Keehn) nor colour responsiveness to Rorschach bear any relation to other measures of these perceptual styles.

An explanation for these relationships may be in terms of the tests used. Tests of colour-form

dominance demand an immediate response. Administration of the Keehn tests included instructions to respond immediately, and the coloured bands on the Thurstone film appeared for exactly 1.5 seconds. The hypothesis that a colour response is essentially impulsive, and that a form response demands a greater amount of time to grasp formal and structural qualities (from which hypotheses relating to personality are derived) may mean that colour-form dominance tests are biased towards colour responders. Thurstone (1944) found that colour dominance positively loaded a speed of perception factor. He concludes that form responders are probably slower in perceiving. This observation is in line with the theory advanced here. That is, that whereas colour responders will respond characteristically on such tests, form dominants may also initially produce colour responses, since there is not enough time for the form responders to respond characteristically. Colour-form tests may therefore reflect an excessive and misleading number of colour responders, some of which are essentially form dominant. They will reflect colour dominance reliably.

No time limit is imposed for Rorschach responses; the subject has time to analyse the configuration and so structural qualities may have more chance to emerge. Hence, someone who is essentially a colour responder may produce form responses on Rorschach. The form responder on the other hand will have plenty of time to react characteristically.

It may therefore be the case that whereas colour-form tests are a reliable measure of colour dominance, Rorschach is not, and conversely Rorschach may be a reliable measure of form responsiveness but not colour responsiveness. Hence, if colour and form comparison scores are reflecting anything which bears a relation to measures of perceptual style, it is to be expected that they will relate to those scores which reliably measure and cover the majority of colour responses. Therefore colour dominance and form responsiveness on Rorschach will relate to colour comparison and form comparison scores respectively.

Tests of movement responsiveness, on the other hand, interrelate to a considerable extent. Movement threshold relates to Rorschach measures of movement responsiveness and in turn both movement threshold and movement responsiveness on Rorschach relate to movement comparison scores.

These results may be stated in terms of colour, form and movement responsiveness to painting. Comparison scores relate to other measures of perceptual style. Propensity to compare Expressionist paintings in terms of colour relates to colour dominance, whereas form comparison scores bear a relation to form responsiveness on Rorschach. Propensity to compare paintings in terms of movement relates to movement threshold and Rorschach movement responses. The comparison scores do not relate to colour form or movement responsiveness to paintings in another context — free response. Colour, form and movement responsiveness to paintings would not seem to be a unitary dimension. To compare paintings in terms of colour form and movement bears a closer relation to measures of perceptual style outside a painting context — colour dominance, Rorschach form, movement threshold, and Rorschach movement — than to such responses in relation to painting in another situation.

The conclusion must be that in relation to colour responsiveness there are three types of expression: colour responsiveness on Rorschach; colour dominance, linking propensity to compare Expressionist paintings in terms of colour; and colour responses to Expressionism in a free response situation.

There are three types of expression of form responsiveness: form responsiveness to Rorschach, linking propensity to compare Cubist paintings in terms of form; form dominance; and form responsiveness to Cubism in a free response situation.

Movement responsiveness seems to be a more unitary dimension, expressed irrespective of test situation. There are two types of expression: movement threshold, linking movement responses to Rorschach, and in turn both of these linking propensity to compare Futurist paintings in terms of movement; and movement responsiveness to Futurist paintings in a free response situation.

Bearing in mind these types of colour, form and movement responsiveness, it is now plausible to review results pertaining to their relation to personality variables.

### **3. COLOUR, FORM AND MOVEMENT RESPONSIVENESS IN RELATION TO PERSONALITY TRAITS**

This section comprises results pertaining to the hypotheses relating perceptual style to personality. Relevant experimental studies bearing upon these hypotheses were reviewed in Chapter 2. The hypotheses are the following:

#### **Colour**

1. Colour reactivity is related to emotionality and impulsivity.
2. Colour reactivity is related to social extraversion.

#### **Form**

1. Form responsiveness is related to non-impulsivity and emotional inhibition.
2. Form responsiveness is related to social introversion.

#### **Movement**

1. Movement responsiveness is related to emotional control and non-impulsivity.
2. Movement responsiveness is related to introversive tendencies. Since this included several factors,

Hypothesis 2 can be stated as two sub hypotheses:

- 2a. Movement responsiveness is related to imagination, intelligence and creativity.
- 2b. Movement responsiveness is related to social introversion.

These hypotheses have been studied in relation to Rorschach measures of perceptual style, and much support has been amassed for them with the exception of hypothesis 2 in relation to form, and introversion. As far as can be ascertained from the literature to date concerning form responsiveness on Rorschach,

hypothesis 1 has received the lion's share of attention to the exclusion of hypothesis 2.

All hypotheses relating to colour, form and movement responsiveness have gleaned support from studies using tests of colour-form dominance and movement threshold.

Studies attempting to test these hypotheses using stimuli other than Rorschach and specific tests (colour-form dominance, and movement threshold) have been rare. Only colour responsiveness, defined as use of colour in painting, have been studied in relation to personality factors. (Alschuler and Hattwick, 1947).

This section reports the results of a study attempting to relate personality to colour form and movement responsiveness in relation to paintings, and specifically paintings which, according to the artists, rely on the respective attributes of colour, form and movement for their effects. The study also involved further testing of the hypotheses outlined above in relation to Rorschach, and tests of colour-form dominance and movement threshold.

Results <sup>x</sup> are reported in the following Order: Rorschach in relation to personality variables; specific tests of perceptual style (colour-form dominance and movement threshold) in relation to personality variables; and colour, form and movement responsiveness to paintings in relation to personality variables.

In each case the hypotheses advanced were derived from experimental studies using Rorschach, as outlined above.

#### **A. Rorschach Colour, Form and Movement Responsiveness in Relation to Personality**

To relate Rorschach measures of colour, form and movement responsiveness to personality factors was subsidiary to the main aim of this study: relating colour, form, and movement responsiveness to painting to personality. The Rorschach was administered to a subsidiary sample of 20 people for three reasons and this section concerns the third of the triad; these reasons were the following. Firstly, to relate Rorschach to other measures of perceptual style-colour form dominance, movement threshold and responsiveness to painting. Rorschach in relation to responsiveness to painting has not been studied before. Results were reported in the last section. Secondly, to use Rorschach as a measure of personality subsidiary to the 16PF, and thus relate ratios derived from it to colour, form and movement responsiveness to paintings. Appendix C includes results pertinent to this Rorschach function. Finally, Rorschach was included in this study in order to use it as a measure of perceptual style and relate it to personality. The latter aim did not constitute an attempt to replicate previous experiments, since studies of this nature are prolific enough (see Chapter 2). Moreover, the Rorschach sample was too small to give rise to conclusions of any weight. This section is included since it would seem from the review of relevant literature that Rorschach has not been related to the 16PF in any study done so far. It is, moreover, a type of acknowledgment of the fact that hypotheses used in the main part of the study were derived from Rorschach studies of this nature.

<sup>x</sup>*Subsidiary results derived from the correlation matrix, and not directly related to the hypotheses are reported in Appendix B.*

The review of studies relating Rorschach colour form and movement responsiveness to personality (Chapter 2) concluded that all hypotheses had been substantiated with a remarkable degree of consistency, with one exception; Rorschach form responses have not been studied in relation to social introversion. The following results, exiguous though they may be, are offered in an attempt to relate them to conclusions derived from the bulk of studies reviewed in chapter 2.

### Colour

The specific hypotheses relating colour responses on Rorschach to personality are:

1. CF and C responses on Rorschach are related to emotionality and impulsivity.
2. CF and C responses on Rorschach are related to social extraversion.

As table 15 shows, Hypothesis 1 was not confirmed. CF and C responses did relate to one factor on the 16PF, at a level approaching the .05 level of significance; this factor was O, guilt-proneness, and the correlation was in the predicted direction.

Hypothesis 2 was confirmed. CF and C responses correlated with factor F, surgency.

Table 15

#### Rank Correlation Coefficients for Rorschach Colour Responsiveness (CF + C) and Personality

| Emotionality   |                     | Extraversion   |                     |
|----------------|---------------------|----------------|---------------------|
| Scale          | Rho                 | Scale          | Rho                 |
| C              | + .282              | A              | + .053              |
| G              | - .319              | E              | + .270              |
| L              | - .116              | F              | + .376 <sup>x</sup> |
| O              | + .341 <sup>x</sup> | Q <sub>2</sub> | + .047              |
| Q <sub>3</sub> | + .216              |                |                     |
| Q <sub>4</sub> | - .301              |                |                     |

x P = .05  
N = 20

### Form

The specific hypotheses relating to Rorschach form responses were:

1. F responses on Rorschach are related to non-impulsivity and emotional inhibition.
2. F responses on Rorschach are related to social introversion.

Hypothesis 1 was not confirmed (see Table 16). The highest correlation for F responses and 16PF factors was between F and C ego strength, which, though in the predicted direction, was not significant.

Hypothesis 2 was confirmed. Rorschach F responses negatively related to factor F, surgency. This

correlation was in the predicted direction and significant.

Table 16

Rank Correlation Coefficients for Rorschach Form Responses (F) and Personality

| Control        |        | Introversion   |                     |
|----------------|--------|----------------|---------------------|
| Scale          | Rho    | Scale          | Rho                 |
| C              | + .211 | A              | - .173              |
| G              | - .262 | E              | - .125              |
| L              | - .026 | F              | - .445 <sup>x</sup> |
| O              | - .015 | Q <sub>2</sub> | + .002              |
| Q <sub>3</sub> | - .048 |                |                     |
| Q <sub>4</sub> | + .103 |                |                     |
| x P = .05      |        | N = 20         |                     |

**Movement**

Hypotheses relating Rorschach movement responses were:

1. M responses on Rorschach are related to emotional control and non-impulsivity.
- 2a. M responses on Rorschach are related to imagination, intelligence and creativity.
- 2b. M responses on Rorschach are related to social introversion.

Hypothesis 1 was confirmed (see Table 17). M responses on Rorschach related positively to factor C, ego strength, and negatively to factor O, guilt-proneness. Both correlations were in the predicted direction and significant.

Hypothesis 2a was not confirmed, though M responses correlated positively with factor M, autia, as predicted, the correlation was not significant.

Evidence for the hypothesized relation of movement responsiveness on Rorschach and imagination may stem from the subsidiary correlation found between Rorschach M and Q<sub>1</sub> (16PF) radicalism and experimental thought. This is reported with subsidiary results in Appendix B.

Hypothesis 2b was confirmed. M responses correlated positively with factor Q<sub>2</sub> independence. This correlation was in the predicted direction and significant.

Table 17

Rank Correlation Coefficients for Rorschach Movement Responsiveness (M) and Personality

| Control |                     | Imagination etc. |        | Introversion |        |
|---------|---------------------|------------------|--------|--------------|--------|
| Scale   | Rho                 | Scale            | Rho    | Scale        | Rho    |
| C       | + .400 <sup>x</sup> | B                | - .105 | A            | + .249 |
| G       | + .239              | I                | - .102 | E            | + .145 |



| Scale          | Rho                 | Scale | Rho    | Scale          | Rho                 |
|----------------|---------------------|-------|--------|----------------|---------------------|
| L              | + .331              | M     | + .212 | F              | + .132              |
| O              | - .463 <sup>x</sup> |       |        | Q <sub>2</sub> | + .380 <sup>x</sup> |
| Q <sub>3</sub> | + .268              |       |        |                |                     |
| Q <sub>4</sub> | - .101              |       |        |                |                     |

<sup>x</sup> P = .05

N = 20

Hypothesis

## Conclusion

Results pertaining to Rorschach measures of colour form and movement responsiveness are in line with previous studies. Rorschach hypotheses were not refuted totally for either colour form or movement responsiveness, which is encouraging considering the size of sample on which these results are based. Hypotheses which were not confirmed, but for which correlations emerged in the predicted direction (and for colour, at least approaching marginal significance) were the following:

Hypothesis 1 relating colour to emotionality; hypothesis 1 relating form to emotional control; and hypothesis 2a relating movement to imagination and intelligence. These hypotheses have been well attested in previous Rorschach studies.

Confirmation of hypothesis 2 for colour, and hypotheses 1 and 2b for movement, parallels results of previous studies. The substantiation for hypothesis 2 and form responses is encouraging, since previous work has largely ignored this hypothesis.

These results do not constitute conclusive evidence for Rorschach hypotheses, but, alongside the results reported in Chapter 2, they add further weight to well attested relationships.

## B. Colour Form Dominance and Movement Threshold in Relation to Personality

The review of studies relating personality to colour, form and movement responsiveness concluded that much support had been derived for these hypotheses using tests other than Rorschach. In assessing personality, these studies had used both questionnaire and rating techniques.

Results reported in this section are in line with previous findings. In order to measure colour form and movement responsiveness independently of Rorschach, a battery of colour form tests derived from Keehn, the Thurstone colour-form film, and the Barron movement threshold ink blots were used. All, except the Thurstone test, were administered to a sample of 71 subjects. The Thurstone test was given to 34 subjects. The 16PF test was administered to 71 subjects and the DPI was administered to 23 people. These two tests were analysed in relation to all measures of perceptual style. Since Rorschach, as a personality instrument and Lüscher were included in the test battery for purely exploratory reasons, caution must be used in the interpretation of both tests (especially since it is hypotheses derived from Rorschach that are the subject of this study). Results pertinent to these tests are often referred to in the main report of results, but are reported fully in Appendices C and D.

Rorschach ratios, indicative of personality types and pertinent to the main hypotheses, were derived from 20 Rorschach protocols; these ratios were  $M : FM + m$  and  $FC : CF + C$  indicative of emotionality; and  $M : Sum C$  indicative of introversive-extravertive tendencies or *erlebnistyp*. Rorschach does not give a measure of extraversion, which is not involved with other factors included in the *erlebnistyp* rubric.

This study differed from previous studies using the measures of colour-form dominance and movement threshold, in so far as the personality tests have not been used before. The Thurstone test was also a new addition to the colour-form dominance test battery. Since this test related to the Keehn tests (see section 2A) correlations between personality factors and either the Keehn tests or the Thurstone test are regarded as substantiation for the hypotheses. The hypotheses are those advanced above. Results are reported in Tables 18, 19 and 20.

### Colour-Form Dominance

Hypothesis 1, relating colour to emotionality, and form to control of emotionality, was confirmed. Colour dominance on test 1 of the Keehn battery related to Ou (DPI) unconventionality. It also related to  $FM + m$  predominance on the Rorschach  $M : FM + m$  ratio, and other scales indicative to some extent of emotionality, S (DPI) sexuality and N (16PF) shrewdness. It also related negatively to As (DPI) sadism, which relates to inhibition. (See Appendices B and C).

Hence, in line with Hypothesis 1, colour dominants (test 1, Keehn) tend to be impulsive and emotional, form dominants tend to be controlled.

Colour dominance on tests 1 to 5 of the Keehn battery related to  $FM + m$  predominance on the Rorschach  $M : FM + m$  ratio, at a level of marginal significance. This is also in line with Hypothesis 1 (see Appendix C).

Colour dominance as reflected by the Thurstone test related to factor L (16PF) protension. Hence, according to the Thurstone measure of colour dominance, colour dominants tend to be anxious and emotional and form dominants tend to be stable.

Table 18

#### Intercorrelations for Colour-Form Dominance and Measures of Emotionality

| Scale          | Keehn 1<br>D or $x^2$ | Keehn 1 - 5<br>D or $x^2$ | Thurstone<br>Rho   |
|----------------|-----------------------|---------------------------|--------------------|
| C              | .125                  | .105                      | -.002              |
| G              | .064                  | 5.21 <sup>x</sup>         | †.164              |
| L              | .235                  | .196                      | +.343 <sup>x</sup> |
| O              | .201                  | .121                      | +.013              |
| Q <sub>3</sub> | .032                  | .126                      | -.120              |
| Q <sub>4</sub> | .031                  | .121                      | +.097              |
| Oi             | .105                  | .136                      | -.008              |
| Ov             | .130                  | .176                      | -.222              |
| Ou             | 5.20 <sup>x</sup>     | .280                      | -.195              |
| Ac             | .364                  | .001                      | +.234              |

$x P = .05$  (for  $x^2$ , one tail)     $N = 71$  (16PF sample)     $N = 23$  (DPI sample)

Hypothesis 2, relating colour to extraversion, and form to introversion was confirmed. Colour dominance as measured by test 1 of the Keehn battery related negatively to  $Q_2$  (PF) independence. Colour dominance therefore relates to group dependence, and form dominance to self-sufficiency.

Colour dominance on tests 1 to 5 of the Keehn battery related to SA (DPI) social activities. Hence colour dominants tend to be gregarious and form dominants tend to be socially introverted.

Colour dominance as indicated by Thurstone's film did not relate to any measure of extraversion. It did show a positive correlation with F (16PF) surgency, which, though in the predicted direction, was not significant.

Table 19

Intercorrelations for Colour Form Dominance and Measures of Extraversion

| Scale | Keehn 1<br>D or $x^2$ | Keehn 1-5<br>D or $x^2$ | Thurstone<br>Rho |
|-------|-----------------------|-------------------------|------------------|
| A     | .132                  | .097                    | - .191           |
| E     | .128                  | .098                    | - .003           |
| F     | .101                  | .134                    | + .261           |
| $Q_2$ | 9.034 <sup>xx</sup>   | .259                    | + .074           |
| SA    | .369                  | 4.85 <sup>x</sup>       | + .280           |
| Ws    | .276                  | .052                    | - .258           |
| Pe    | .152                  | .181                    | + .184           |
| EI    | .235                  | .226                    | - .212           |

x P = .05 (one tail)

xx P = .01 (one tail)

N = 71 (16PF sample)

N = 21 (DPI sample)

### Movement Threshold

Hypothesis 1, relating movement responsiveness to emotional control and non-impulsivity, was confirmed. Low movement threshold, or facility to see movement in the Barron ink blots, related to three DPI measures of non-impulsivity. It related negatively to Oi, impulsivity, and Ou, unconventionality, and positively to Ac, conservatism and inhibition.

Hypothesis 2a, relating movement responsiveness to imagination, creativity and intelligence, was confirmed. Low movement threshold related to I (16PF) premsia. Hence propensity to attribute movement to a configuration relates to sensitivity and imagination.

Low movement threshold also related to M predominance on the Rorschach M : Sum C ratio. This relationship is not surprising since (as reported in section 2C) low movement threshold does relate to M responses on Rorschach. However, the ratio, which is M pitted against C and not a straight M count,

may indicate that imagination, intelligence and creativity, as well as social introversion, relate to low movement threshold.

Hypothesis 2b relating movement responsiveness to social introversion, was confirmed. Low movement threshold related to Ws (DPI) seclusion, and negatively correlated with EI (DPI) initiative, and social extraversion.

Table 20

Product Moment† and Rank Correlation Coefficients for Movement Threshold and Personality

| Control        |                     | Imagination etc. |                     | Introversion   |                     |
|----------------|---------------------|------------------|---------------------|----------------|---------------------|
| Scale          | r or rho            | Scale            | r or rho            | Scale          | r or rho            |
| C              | - .047              | B                | + .045              | A              | - .107              |
| G              | + .085              | I                | - .283 <sup>x</sup> | E              | - .109              |
| L              | - .082              | M                | - .086              | F              | - .031              |
| O              | + .052              | CI               | - .056              | Q <sub>2</sub> | - .007              |
| Q <sub>3</sub> | + .056              | TI               | + .211              | SA             | - .256              |
| Q <sub>4</sub> | + .083              |                  |                     | Ws             | + .360 <sup>x</sup> |
| Oi             | - .449 <sup>x</sup> |                  |                     | Pe             | - .269              |
| Ov             | - .025              |                  |                     | EI             | - .346 <sup>x</sup> |
| Ou             | - .374 <sup>x</sup> |                  |                     |                |                     |
| Ac             | + .449              |                  |                     |                |                     |

<sup>x</sup> P = .05

† Product Moment correlations were calculated for 16PF and movement threshold  
Rank correlations were calculated for DPI and movement threshold. Hence a product moment correlation is in the predicted direction if it is negative.

N = 71 (16PF sample)

N = 23 (DPI sample)

## Conclusion

All hypotheses, relating colour-form dominance and movement threshold to personality were confirmed. This is further support for the results of studies reported above using the same type of test.

## 4. COLOUR, FORM AND MOVEMENT RESPONSIVENESS IN RELATION TO PAINTINGS AND PERSONALITY

The scores derived for colour form and movement responsiveness to paintings in the free response and comparison situations were outlined above (Chapter 3).

The following results are those derived from correlations between the free response, comparison and percentage scores and the personality measures: 16PF and DPI. Results pertaining to Rorschach

and Lüscher in relation to these measures are reported in Appendices C and D.

Results pertaining to the relation of personality and these scores are reported in the following order: comparison scores for colour, form and movement, free response scores, and finally percentage scores.

The hypotheses advanced derive from Rorschach studies and were outlined above. Much support has been amassed for these hypotheses in this, and previous studies, when the measures of perceptual style are Rorschach, colour form dominance tests and movement threshold ink blots. This section reports results pertinent to extension of these hypotheses in relation to colour, form and movement responsiveness to paintings. Tables 21 to 27, at the end of this section, tabulate the results.<sup>x</sup>

#### **Colour : Comparison Situation**

Hypothesis 1 was confirmed. The colour comparison score correlated positively with Ov (DPI) verbal aggression and Oi (DPI) impulsivity. It correlated negatively with Ac (DPI) conservatism and inhibition.

Hence, propensity to compare Expressionist paintings with Cubist and Futurist works in terms of their colour is related to impulsivity and emotionality. Further support for this hypothesis derives from the Lüscher test. Profile 6 emotionality, when pitted against profile 2 inhibition, related to colour comparison scores (see Appendix D).

Hypothesis 2 was confirmed. The colour comparison score correlated positively with A (16PF) affectothymia, or social extraversion (see Tables 21 and 22).

#### **Form : Comparison Situation**

Hypothesis 1 was confirmed. Form comparison scores related negatively to L (16PF) protension and O (16PF) guilt-proneness.

Propensity to compare Cubist paintings with others in terms of form bears a relation to control of emotionality and anxiety.

Hypothesis 2 was not confirmed. Form comparison scores were found to correlate positively with A (16PF) affectothymia and Pe (DPI) exhibitionism (see Tables 23 and 24).

Hence form responsiveness in a comparison situation is related to social extraversion. The result is opposite to that predicted.

#### **Movement : Comparison Situation**

Hypothesis 1 was confirmed. A negative correlation emerged between movement comparison scores and factor L (16PF) protension.

Tendency to compare Futurist paintings in terms of movement would seem to relate to emotional

<sup>x</sup>For all tables,  $N = 71$  (16PF sample)  $N = 23$  (DPI sample)

control and freedom from anxiety.

Hypotheses 2a and 2b were confirmed. Movement comparison scores correlated positively with B (16PF) intelligence. They also related negatively to factor E (16PF) dominance. This factor loads the second-stratum extraversion factor (see Tables 25, 26 and 27).

Further support for hypothesis 2a relating movement comparison to intelligence, imagination and creative interests is derived from subsidiary correlations found between the movement comparison score and factor Q<sub>1</sub> (16PF) radicalism and experimental thought (see Appendix B) and the correlation between this score and the Lüscher profile indicative of aesthetic sensitivity and imagination. (See Appendix D).

### **Comparison Scores – Colour, Form and Movement**

All hypotheses were substantiated for the comparison situation with the exception of hypothesis 2 relating to form and social introversion.

Colour comparison scores were found to relate to colour dominance (see section 2E), and, like colour dominance, were found to relate to DPI measures of impulsivity. Colour dominance (test 1, Keehn) related to Ou (DPI) unconventionality and colour comparison related to Ov (DPI) verbal aggression and Oi (DPI) impulsivity. Likewise, colour comparison scores were found to relate to Oi and Ov. Similarly, both colour dominance and colour comparison related to measures of social extraversion.

Form comparison scores, which were found to relate to Rorschach form responses, did not relate to the same hypothesized personality variables. Rorschach form responsiveness was found to relate to social introversion (correlating negatively with F (16PF) surgency) but did not significantly relate to any measure of emotional control. Form comparison scores, on the other hand, related negatively to two measures of emotionality (L (16PF) protension O (16PF) guilt) but related to social extraversion (A (16PF) affectothymia and Pe (DPI) exhibitionism). Past studies of Rorschach form responsiveness have confirmed hypothesis 1 at the expense of hypothesis 2, which has received little attention, and it may be that this is because it has not amassed much support. The results for the form comparison score, which relates to emotional control but not introversion, are in line with the bulk of previous studies.

Hypotheses relating movement comparison scores to personality were also confirmed. This score was found to relate to movement threshold and the Rorschach M score. Hypotheses were also corroborated for these measures of movement responsiveness with the exception of hypothesis 2a and Rorschach M. This hypothesis has, however, been largely substantiated in previous studies.

Results concerning colour form and movement responsiveness to paintings in relation to personality are in line with previous work, using Rorschach. The pattern of hypothesis confirmation is the same. All hypotheses, with the exception of that relating form responsiveness to introversion, have received support. It would seem that extension of Rorschach hypotheses to more complex configurations, like paintings, is feasible.

### **Colour : Free Response Situation**

Hypothesis 1 was confirmed. Free colour response scores related negatively to C (16PF) ego strength.

Colour responsiveness to Expressionism in a free response situation would seem to relate to emotionality and impulsivity.

Hypothesis 2 was confirmed. Free colour response related to factor A (16PF) affectothymia, or social extraversion (see tables 21 and 22).

### **Form : Free Response Situation**

Hypothesis 1 was confirmed. Free form response scores correlated negatively with O (16PF) guilt-proneness, and positively with Q<sub>3</sub> (16PF) strength of self-sentiment.

Form responders in a free response situation would seem to be free from anxious and depressive symptoms, and to be socially precise, following their own self-image.

Hypothesis 2 was not confirmed. Form responses correlated positively with F (16PF) surgency, a factor in extraversion (see Tables 23 and 24). This goes against the prediction derived from hypothesis 2.

### **Movement : Free Response Situation**

Hypothesis 1 was confirmed. Free movement response scores related negatively to O<sub>i</sub> (DPI) impulsivity and O<sub>v</sub> (DPI) verbal aggression. The second correlation was marginally significant, but in the predicted direction.

Hypothesis 2a was not confirmed. Free movement response scores did not relate to any measure of intelligence, imagination or creativity, though it related positively and marginally to B (16PF) intelligence.

Hypothesis 2b was confirmed. Free movement response scores correlated negatively with Pe (DPI) exhibitionism (see Tables 25, 26 and 27).

Movement responsiveness to Futurism would seem therefore to relate to one facet of introversive tendencies — social introversion.

### **Free Response Scores — Colour, Form and Movement**

Hypotheses confirmed for the free response measures of perceptual style parallel those confirmed for other measures, with the exception of hypothesis 2a and movement responsiveness.

In line with studies relating Rorschach to personality variables, and in line with results pertaining to the comparison score, both hypotheses for colour responsiveness were confirmed, and hypothesis 1 was confirmed for form responsiveness. Also supporting previous results is the confirmation of hypotheses 1 and 2b for movement responsiveness. Hypothesis 2a, though not corroborated, receives some support from the marginal correlation found for free movement response scores and B (16PF) intelligence.

The free response score bears no relation to other measures of perceptual style. It would, however, seem to relate fairly consistently to hypothesized personality variables.



### Colour %

Hypothesis 1 was confirmed. Colour % scores related to Q<sub>4</sub> (16PF) ergic tension.

This result suggests that specific and appropriate responsiveness to Expressionism relates to anxiety and tension.

Hypothesis 2 was not confirmed. The colour % score did not relate to any measure of extraversion.

A marginally significant correlation emerged for this score and A (16PF) affectothymia, which was in the predicted direction, but did not attain the .05 level of significance (see Tables 21 and 22).

Since hypothesis 2 was not fully substantiated, it is not surprising to find that subsidiary results (Appendix B) furnish evidence which suggests that rather than relating to extraversion, the colour % score relates to scales indicative of introversive traits<sup>x</sup>: imagination, sensitivity and social introversion. Colour % related positively and significantly to factor M (16PF) autia and factor I (16PF) premisia.

### Form %

Hypothesis 1 was not confirmed. The form % score correlated positively with Ou (DPI) unconventionality. This is in the opposite direction to that predicted.

Hypothesis 2 was not confirmed. The form % score related significantly to three measures of extraversion: F (16PF) surgency, EI (DPI) initiative and low scores on Ws (DPI) seclusion (see Tables 23 and 24).

Some evidence, though extremely tentative, for hypothesis 1, relating to control, is derived from the correlation found between form % and FC predominance on the Rorschach ratio  $FC : CF + C$ . This may indicate that form % relates to a measure indicative of control (see Appendix C).

Subsidiary results also suggest that this score relates significantly to B (16PF) intelligence (see Appendix B), which may be of interest considering that hypotheses 1 and 2 were not confirmed and form % does not relate to hypothesized personality variables.

### Movement %

Hypothesis 1 was not confirmed. Movement % related positively to Ou (DPI) unconventionality. This result is contrary to the prediction.

Hypothesis 2a was confirmed. The movement % score related positively to B (16PF) intelligence.

Hypothesis 2b was not confirmed. None of the correlations for movement % and measures of introversion approximated significance (see Tables 25, 26 and 27).

### % Scores — Colour, Form and Movement

These scores reflect appropriate colour form and movement responses to Expressionism, Cubism.

<sup>x</sup> *Introversive is used here according to the Rorschach definition of the term. That is, it involves imagination, being "turned inward" and social introversion.*

and Futurism respectively with general colour form and movement responses to all paintings controlled. Hence the colour % score reflects number of colour responses to Expressionism regardless of how many there were to Cubism and Futurism. The scores were derived from free response and comparison situations.

When these scores are related to hypothesized personality measures, results are very different from those pertaining to other measures of perceptual style. Only two hypotheses were confirmed for the % scores: these were hypothesis 1 relating colour to emotionality, and hypothesis 2a, relating movement to intelligence.

The colour-emotionality hypothesis is the one which has had most substantiation in studies using Rorschach, and colour-form tests. Some evidence for the hypothesis also derives from Alschuler and Hattwick's study (1947) which related emotionality to use of colour in paintings. Results from this study consistently lend support to this hypothesis, and the colour % score also related to emotionality as predicted.

The movement-intelligence hypothesis (2a) also has gleaned much support from previous studies. In this study it was also confirmed in relation to all scores but the free movement response score, and then a positive correlation for this score and intelligence emerged which approached a level of marginal significance.

Failure to gain support for hypothesis 2 relating form responsiveness to social introversion is paralleled by previous studies, and results from this study using measures of form responsivity to paintings.

Failure to gain support with % scores for the other hypotheses — hypothesis 2 : colour and extraversion; hypothesis 1 : form and control; hypothesis 1 : movement and control; and hypothesis 2b : movement and introversion — is unparalleled by results of studies using other measures of perceptual style.

Either the percentage scores are not reflecting anything which bears a relation to other types of colour form and movement responsiveness, or the type of responsiveness they measure is related to factors other than personality variables. The former alternative is unlikely since regardless of how refined the percentage scores are (in so far as they control for general colour responsiveness) they were derived from the free response and comparison scores and do correlate with them (see Tables 9, 10 and 11, Section 2B). That these scores do in fact relate to factors other than personality variables and that these factors — called by Child (1965) cognitive styles — may be related to something like aesthetic sensitivity is the subject of a following section. Section 6 reports results pertaining to the relation of the various measures of perceptual style used in this study in relation to cognitive style.

Table 21

**Rank Correlation Coefficients for Colour Responsiveness to Paintings (Colour Comparison, Free Response and %) and Emotionality**

| Scale          | Comparison           | Free Response       | %                    |
|----------------|----------------------|---------------------|----------------------|
| C              | - .103               | - .216 <sup>x</sup> | + .042               |
| G              | + .104               | + .173              | + .030               |
| L              | + .037               | + .037              | - .085               |
| O              | - .092               | + .100              | + .168               |
| Q <sub>3</sub> | - .067               | + .189              | - .049               |
| Q <sub>4</sub> | + .084               | + .084              | + .321 <sup>xx</sup> |
| Oi             | + .371 <sup>x</sup>  | + .193              | - .030               |
| Ov             | + .669 <sup>xx</sup> | + .262              | + .241               |
| Ou             | + .220               | + .121              | + .175               |
| Ac             | - .487 <sup>x</sup>  | + .209              | + .174               |

x P = .05

xx P = .01

Table 22

**Rank Correlation Coefficients for Colour Responsiveness (Colour Comparison, Free Response and %) and Extraversion**

| Scale          | Comparison          | Free Response       | %      |
|----------------|---------------------|---------------------|--------|
| A              | + .254 <sup>x</sup> | + .256 <sup>x</sup> | + .150 |
| E              | + .006              | + .051              | - .144 |
| F              | + .057              | + .138              | - .100 |
| Q <sub>2</sub> | + .002              | - .102              | + .054 |
| SA             | - .043              | - .078              | - .061 |
| Ws             | - .065              | + .154              | - .023 |
| Pe             | + .036              | + .018              | + .064 |
| EI             | + .309              | - .362              | - .043 |

x P = .05

Table 23

**Rank Correlation Coefficients for Form Responsiveness to Paintings (Form Comparison, Free Response and %) and Control**

| Scale | Comparison | Free Response | %      |
|-------|------------|---------------|--------|
| C     | - .002     | + .007        | + .091 |
| G     | - .090     | + .123        | - .028 |

|                |                     |                     |                     |
|----------------|---------------------|---------------------|---------------------|
| L              | - .240 <sup>x</sup> | - .168              | - .126              |
| O              | - .245 <sup>x</sup> | - .218 <sup>x</sup> | - .024              |
| Q <sub>3</sub> | + .005              | + .246 <sup>x</sup> | - .002              |
| Q <sub>4</sub> | - .002              | - .063              | + .024              |
| O <sub>i</sub> | - .061              | + .214              | - .003              |
| O <sub>v</sub> | + .223              | - .161              | + .203              |
| O <sub>u</sub> | + .062              | + .365              | + .403 <sup>x</sup> |
| Ac             | - .047              | - .285              | - .110              |

x P = .05

Table 24

Rank Correlation Coefficients for Form Responsiveness to Paintings (Form Comparison, Free Response and %) and Introversion

| Scale          | Comparison          | Free Response       | %                   |
|----------------|---------------------|---------------------|---------------------|
| A              | + .280 <sup>x</sup> | + .086              | + .036              |
| E              | - .028              | - .038              | - .075              |
| F              | - .015              | + .198 <sup>x</sup> | + .246 <sup>x</sup> |
| Q <sub>2</sub> | - .051              | + .084              | - .088              |
| SA             | - .077              | + .253              | + .335              |
| Ws             | + .097              | - .192              | - .447 <sup>x</sup> |
| Pe             | + .403 <sup>x</sup> | + .229              | + .261              |
| EI             | + .250              | + .277              | + .433              |

x P = .05

Table 25

Product Moment and Rank Difference Correlation Coefficients for Movement Responsiveness in Relation to Painting (Movement Comparison, Free Responses and %) and Control

| Scale          | Comparison          | Free Response       | %      |
|----------------|---------------------|---------------------|--------|
| C              | + .071              | + .013              | - .043 |
| G              | + .056              | + .023              | + .032 |
| L              | - .194 <sup>x</sup> | + .008              | + .080 |
| O              | + .073              | + .013              | - .150 |
| Q <sub>3</sub> | + .105              | - .130              | + .024 |
| Q <sub>4</sub> | + .041              | - .053              | - .080 |
| O <sub>i</sub> | + .009              | - .359 <sup>x</sup> | + .151 |

|    |        |        |                     |
|----|--------|--------|---------------------|
| Ov | + .115 | - .344 | + .089              |
| Ou | + .027 | + .084 | + .413 <sup>x</sup> |
| Ac | + .241 | + .243 | - .326              |

x P = .05

Table 26

Product Moment and Rank Difference Correlation Coefficients for Movement Responsiveness in Relation to Paintings and Imagination, Intelligence and Creative Interests

| Scale | Comparison           | Free Response | %                    |
|-------|----------------------|---------------|----------------------|
| B     | + .314 <sup>xx</sup> | + .150        | + .279 <sup>xx</sup> |
| I     | + .048               | + .162        | - .040               |
| M     | + .056               | - .189        | - .165               |
| CI    | + .154               | - .042        | - .006               |
| TI    | + .137               | - .067        | + .042               |

xx P = .01

Table 27

Product Moment and Rank Difference Correlation Coefficients for Movement Responsiveness to Paintings and Introversion

| Scale          | Comparison          | Free Response       | %      |
|----------------|---------------------|---------------------|--------|
| A              | + .051              | - .025              | + .132 |
| E              | - .194 <sup>x</sup> | - .102              | + .034 |
| F              | + .177              | - .028              | + .108 |
| Q <sub>2</sub> | + .110              | - .094              | - .054 |
| SA             | + .304              | + .308              | + .309 |
| Ws             | + .168              | - .140              | - .290 |
| Pe             | - .181              | - .373 <sup>x</sup> | - .110 |
| EI             | + .260              | - .238              | + .240 |

x P = .05

## 5. PREFERENCE FOR EXPRESSIONISM, CUBISM AND FUTURISM

No hypotheses regarding the relationship of preference for paintings to perceptual style or personality were forwarded.

In so far as liking for a stimulus may presuppose a response to it, the tentative hypothesis may be advanced that measures of colour, form and movement responsiveness (basic, and to paintings) will relate

to preference for those paintings which emphasise these facets (viz. Expressionist, Cubist and Futurist respectively). Wallen (1948) found that lack of colour responsiveness related to dislike of colour.

Similarly it may be tentatively hypothesised that preference for Expressionism, Cubism and Futurism will relate to personality traits hypothesized to relate to colour form and movement responsiveness.

Results are reported without reiterating any predictions. Section A reports results pertaining to perceptual style and preference. Section B relates to personality traits and preference.

#### A. Interrelation of Perceptual Style and Preference for Expressionism, Cubism and Futurism

Results are reported in Tables 28, 29, 30 and 31.

Rorschach colour form and movement responsiveness were found to relate to preference for the respective art movements. Colour responsiveness on Rorschach related to preference for Expressionism, form to preference for Cubism, and movement to preference for Futurism.

Colour-form dominance and movement threshold did not relate to any preference score.

Of the measures of colour, form and movement responsiveness to paintings, only the movement comparison score related to preference for Futurism. Since the movement comparison score also related to movement responsiveness to Rorschach, and movement threshold, the interrelation of the various measures of response to movement seems fairly consistent.

The fact that all Rorschach measures (of colour, form and movement responsiveness) relate to preference for Expressionism, Cubism and Futurism, respectively, suggests that a deep-seated bias towards a particular perceptual style, rather than specific responsiveness to a painting, facilitates preference for the stimulus congruent with that particular perceptual style.

Table 28

Largest Differences (Kolmogorov Smirnov) and Rank Correlation Coefficients for Measures of Colour Responsiveness and Preference for Expressionism

| Keehn 1 | Keehn 1-5 | Thurstone | Rorschach CF + C    |
|---------|-----------|-----------|---------------------|
| D       | D         | Rho       | Rho                 |
| .321    | .171      | + .117    | + .390 <sup>x</sup> |
| N = 71  | N = 71    | N = 34    | N = 20              |

<sup>x</sup> P = .05

Table 29

Largest Differences (Kolmogorov Smirnov) and Rank Correlation Coefficients for Measures of Form Responsiveness and Preference for Cubism

| Keehn 1 | Keehn 1-5 | Thurstone | Rorschach F         |
|---------|-----------|-----------|---------------------|
| D       | D         | Rho       | Rho                 |
| .166    | .218      | - .117    | + .451 <sup>x</sup> |
| N = 71  | N = 71    | N = 34    | N = 20              |

<sup>x</sup> P = .05

Table 30

**Product Moment and Rank Difference Correlation Coefficients for Measures of Movement Responsiveness and Preference for Futurism**

| Movement Threshold | Rorschach M         |
|--------------------|---------------------|
| r                  | Rho                 |
| - .034             | + .483 <sup>x</sup> |
| N = 71             | N = 20              |

<sup>x</sup> P = .05

Table 31

**Intercorrelations (Product Moment) for Preference for Expressionism, Cubism and Futurism and Colour, Form, and Movement Responsiveness to Paintings**

| Score         | Expressionism | Cubism | Futurism            |
|---------------|---------------|--------|---------------------|
| Comparison    | - .155        | + .133 | + .253 <sup>x</sup> |
| Free Response | + .052        | + .044 | + .189              |
| %             | - .178        | - .028 | - .046              |

<sup>x</sup> P = .05

N = 71

**B. Preference for Expressionism, Cubism and Futurism in Relation to Personality Traits**

Results are tabulated in Tables 32, 33 and 34.

**Expressionism**

Preference for Expressionism was found to relate negatively to factor G (16PF) superego strength.

Hence those preferring Expressionism tend to be more emotional.

Subsidiary results (Appendix B) suggest that preference for Expressionism also relates to scales indicative of extratension (in the Rorschach sense of the term). It related negatively to M (16PF) autia, and Q<sub>1</sub> (16PF) radicalism, suggesting a link between preference for Expressionism and realist, concrete thought. It also related to the Rorschach ratio indicative of these extratensive qualities M : Sum C.

This indicates that as well as relating to colour responsiveness on Rorschach, preference for Expressionism related negatively to M.

Table 32

**Product Moment Correlation Coefficients for Preference for Expressionism and Personality**

| Emotionality | Extraversion |
|--------------|--------------|
| Scale        | Scale        |
| r            | r            |
| C            | A            |
| - .127       | - .105       |



|                |                     |                |        |
|----------------|---------------------|----------------|--------|
| G              | - .194 <sup>x</sup> | E              | + .007 |
| L              | - .100              | F              | - .074 |
| O              | - .072              | Q <sub>2</sub> | - .112 |
| Q <sub>3</sub> | + .065              | SA             | - .296 |
| Q <sub>4</sub> | - .100              | Ws             | - .004 |
| Oi             | + .292              | Pe             | - .105 |
| Ov             | + .019              | EI             | - .168 |
| Ou             | - .053              |                |        |
| Ac             | - .060              |                |        |

x P = .05

N = 71 (16PF sample)

N = 23 (DPI sample)

### Cubism

Preference for Cubism did not relate to any scale indicative of emotional control or introversion.

Preference for Cubism was found to relate to FC predominance on the Rorschach ration FC : CF + C (see Appendix C). Since it had been found to relate to Rorschach F responses (previous section) this relationship would not be fully expected. Interpretation of the FC : CF + C ratio indicates some evidence that preference for Cubism relates to control of emotionality.

Preference for Cubism was also found to relate to TI (DPI) or liking for tactile sensations. This is interesting considering the emphasis Cubist painters placed on tactile qualities.

Appendix B reports subsidiary results in full.

Table 33

### Product Moment Correlation Coefficients for Preference for Cubism and Personality

| Control        |        | Introversion   |        |
|----------------|--------|----------------|--------|
| Scale          | r      | Scale          | r      |
| C              | - .074 | A              | - .030 |
| G              | - .041 | E              | + .184 |
| L              | - .061 | F              | + .044 |
| O              | + .106 | Q <sub>2</sub> | + .051 |
| Q <sub>3</sub> | + .009 | SA             | + .057 |
| Q <sub>4</sub> | - .109 | Ws             | + .150 |
| Oi             | + .153 | Pe             | - .042 |
| Ov             | - .084 | EI             | + .005 |
| Ou             | + .161 |                |        |
| Ac             | - .317 |                |        |

N = 71 (16PF sample)

N = 23 (DPI sample)

## Futurism

Preference for Futurism related to Q<sub>3</sub> (16PF) high self-sentiment integration. Hence preference for Futurism relates to a degree of stability.

Preference for Futurism did not relate to any measure of intelligence imagination or social introversion, but it did relate to M preponderance on the Rorschach ratio M : Sum C (see Appendix C). This indicates some degree of relationship between preference for Futurism and introversive qualities: imagination, intelligence and social introversion.

Table 34

### Product Moment Correlation Coefficients for Preference for Futurism and Personality

| Control        |                     | Imagination etc. |        | Introversion   |        |
|----------------|---------------------|------------------|--------|----------------|--------|
| Scale          | r                   | Scale            | r      | Scale          | r      |
| C              | + .019              | B                | - .079 | A              | + .128 |
| G              | - .111              | I                | - .047 | E              | - .020 |
| L              | - .067              | M                | + .080 | F              | + .183 |
| O              | - .166              | CI               | - .189 | Q <sub>2</sub> | + .127 |
| Q <sub>3</sub> | + .228 <sup>x</sup> | TI               | + .178 | SA             | - .164 |
| Q <sub>4</sub> | - .031              |                  |        | Ws             | + .322 |
| Oi             | + .072              |                  |        | Pe             | - .260 |
| Ov             | + .150              |                  |        | EI             | - .281 |
| Ou             | + .315              |                  |        |                |        |
| Ac             | - .204              |                  |        |                |        |

<sup>x</sup> P = .05

N = 71 (16PF sample)

N = 23 (DPI sample)

## C. Preference for Paintings : Conclusion

The perceptual styles of colour form and movement responsiveness, as measured by Rorschach, were found to relate to preference for Expressionism, Cubism and Futurism. This suggests some linking of perceptual style and liking of the painting which emphasises aspects congruent with that perceptual style.

Only two personality traits (questionnaire measures) were found to relate to preference for an art movement : emotionality related to preference for Expressionism and control related to preference for Futurism.

The dimension of preference for paintings does not correlate with all the personality traits found to relate to measures of colour, form and movement response to these paintings.

## 6. RELATIONSHIP OF COLOUR, FORM AND MOVEMENT RESPONSIVENESS TO ART BACKGROUND; THEIR DEVIATION FROM CHANCE EXPECTATION, AND RELATION TO COGNITIVE STYLE

This section comprises results pertaining to colour form and movement responses to painting considered as measures of appropriate response.

These measures were related to knowledge of art, because art background would have had to be controlled, had it related to these measures.

In reporting the deviation from chance expectation of these scores, it is hoped to furnish some evidence and justification for terming them measures of appropriate response.

Child's Inventory of Cognitive Styles was included for exploratory reasons, but it too furnishes some evidence that the measures of colour, form and movement responsiveness reflect appropriate response.

### A. Art Background

It was considered necessary to assess a subject's knowledge of art, because this may well have influenced a subject to discuss Expressionism. Cubism and Futurism in terms of colour form and movement respectively, since it was argued (Chapter 3) that these are the most salient features of the art movements. If this were the case, any relationship found between the measures of perceptual style and response to paintings would have to be interpreted in this light, or art background controlled.

Subjects were assessed in terms of art background by interview (Chapter 3). The sample was fairly homogeneous with respect to knowledge of art. Only about five subjects had had any formal training in history of art and this was often in their final year at school. The majority of subjects had not read a book on art history. Subjects differed as to how often they visited art galleries, but this was probably because defining exact frequency of visits was difficult.

The amount of information taken on art background, however, made it possible to rank the total sample from 1 to 71. Rank difference correlations were carried out for response to art and art background.

Table 35 shows that none of the measures of response to painting (free response, comparison and percentage) related to art background. Only the free colour response score approaches the .05 level of significance.

If the measures of colour, form and movement responsiveness do reflect appropriate response they probably show a negligible relationship with art background, as the sample as a whole had very little knowledge of art.

Table 35

**Rank Correlation Coefficients for Art Background and Colour, Form and Movement Responsiveness to Paintings**

|  | Colour | Form   | Movement |
|--|--------|--------|----------|
| Free Response                                  | + .210 | - .136 | + .014   |
| Comparison                                     | + .109 | + .005 | + .187   |
| Percentage                                     | + .120 | + .093 | - .103   |
| N = 71   |        |        |          |
| $t = 2.0$ (df 70) when $\rho = .240$ $P = .05$ |        |        |          |

**B. Deviation from Chance Expectation of Colour, Form and Movement Responsiveness Scores to Paintings**

The colour, form and movement comparison and free response scores were designed to reflect appropriate response in relation to paintings. The rationale is described in Chapter 3. The percentage scores were derived from the comparison and free response scores combined; they reflect colour form and movement responsiveness to paintings which is appropriate (that is, to Expressionism, Cubism and Futurism respectively) regardless of how many colour, form and movement responses were made to other paintings.

It is maintained that these measures of appropriate response may have something in common with the measure of aesthetic judgement most usually employed in experimental studies. Child (1965) measured aesthetic judgement by calibrating the judgement of subjects as to the merit of paintings against expert opinions. Tests of artistic aptitude or appreciation nearly always involve measuring a subject's preference against that of artists and critics.

Referring to such tests as the Meir Art Judgement Test, and the Mc Ardory Art Test, Anastasi (1961) remarks, "Essentially such tests indicate the degree to which the individual's aesthetic taste agrees with that of contemporary experts."

In this study, appropriate response, though not reflecting an evaluative judgement, did comprise response to those aspects of paintings which would be agreed upon by most experts as the most salient features of the paintings. Whereas Child compared an individual's judgement of the better of two works of art with expert opinion, this study in effect compares an individual's judgement as to the most salient features of a work of art with that of experts. Both measures reflect appropriateness of response. Moreover, this study derived the criteria of appropriate response from the opinions of art historians and critics from the turn of the century onwards. Such judgements are less subject to the vicissitudes of time than the opinions of contemporary experts.

In so far as Child's measure of aesthetic judgement and the measure of appropriate response in this study have this much in common, it was considered of interest to relate the measures of appropriate

response — colour form and movement responsiveness to paintings — to the cognitive styles Child studied in order to see if the correlations Child found were in any way paralleled.

Essentially, the measures of colour, form and movement responsiveness used in this study purport to reflect response to, for example, the colour in Expressionist paintings, which is a specific and direct response and not the result of indiscriminate colour responsiveness to all paintings. In fact the percentage scores were designed specifically to do this. However, an individual could respond appropriately, and have a high free colour response score, simply as a function of general propensity to respond to colour. It was posited that if subjects were responding indiscriminately, colour, form and movement responses should occur with equal frequency to all paintings. If, on the other hand, free response and comparison scores reflect responses which are specific to Expressionism Cubism and Futurism, then colour, form and movement responses will occur significantly more often to respective paintings than to others.

In order to test this, the frequency of colour, form and movement responses to all types of painting was calculated. Then the number of responses expected to occur, to each type of painting, if responses were random, was calculated. The deviation from this random number (or chance expectation) of colour responses to Expressionism, form to Cubism, and movement to Futurism, was then worked out (see Appendix H).

Results, reported in Table 36, show that for each score, the critical ratios are significant. This indicates that the probability against colour, form and movement responses occurring randomly and equally to all paintings is high.

**Table 36**

**Critical Ratios and Probabilities for Colour, Form and Movement Responses — Comparison, and Free Response Scores**

| Comparison           | C.R.        | P.        |
|----------------------|-------------|-----------|
| Colour               | 4.08        | .001      |
| Form                 | 2.71        | .007      |
| Movement             | 8.63        | .001      |
| <b>Free Response</b> | <b>C.R.</b> | <b>P.</b> |
| Colour               | 4.90        | .001      |
| Form                 | 10.00       | .0001     |
| Movement             | 11.10       | .0001     |

Therefore, response to Expressionism in terms of colour, Cubism in terms of form and Futurism in terms of movement, did not occur as a result of indiscriminate colour form and movement responsiveness to all types of painting. This is regarded as evidence that the free response and comparison scores are measuring a response to painting which is the result of designed purposive appraisal, and specific to an aesthetic object.

Table 36 also indicates that the comparison and free response scores differ in the degree to which they deviate from random guesswork. Consistently the free response scores have larger critical ratios than the comparison scores. This would suggest that the relationship of the free response score to appropriate response is more intimate. This is also supported by the results pertaining to the relationship of these scores and basic measures of perceptual style. The free response scores showed no relationship with any measure of colour-form dominance, or movement threshold, whereas the colour comparison score related to colour dominance (Section 2E), the form comparison to form responses on Rorschach, and the movement comparison to movement responses on Rorschach, and low movement threshold. As would be expected, the comparison scores also show a much higher and significant correlation with the total number of colour, form and movement responses mentioned overall (see Table 37).

**Table 37**

**Intercorrelations (Product Moment) for Total Colour, Form and Movement Responses (mentioned scores) and Free Response and Comparison Scores.**

| Score         | Colour<br>Mentioned   | Form<br>Mentioned     | Movement<br>Mentioned |
|---------------|-----------------------|-----------------------|-----------------------|
| Comparison    | + .789 <sup>xxx</sup> | + .816 <sup>xxx</sup> | + .830 <sup>xxx</sup> |
| Free Response | + .228 <sup>x</sup>   | + .487 <sup>xx</sup>  | + .609 <sup>xxx</sup> |

x P = .05

xx P = .01

xxx P = .001

N = 71

Considering response in terms of determinant, the movement response would seem to show the highest critical ratio (Table 36). In the free response situation form shows the next highest deviation from chance. Perhaps colour responsiveness bears the least relationship to response to painting which is considered and appropriate, whereas movement responsiveness is intimately connected.

### **C. Cognitive Style**

Child's inventory of cognitive styles (1965) was described in Chapter 3. Child found that certain cognitive styles related significantly to his measure of aesthetic judgement (comparison of judgement with a criterion group).

Child's results are reported in Table 38.

Table 38

## Correlations between Aesthetic Judgement and Cognitive Style : Child 1965

| Cognitive Style                 | N   | Aesthetic Judgement | Art Background Controlled |
|---------------------------------|-----|---------------------|---------------------------|
| Scanning                        | 138 | + .29 <sup>xx</sup> | + .19 <sup>x</sup>        |
| Regression                      | 49  | + .29 <sup>x</sup>  | + .20                     |
| Field Independence              | 79  | + .13               | + .06                     |
| Flexibility                     | 138 | - .06               | - .15                     |
| Sharpening                      | 138 | + .06               | - .02                     |
| Narrowness of Equivalence Range | 138 | + .14               | + .10                     |

xx P .01

x P .05

It can be seen that while two of the measures — scanning and regression correlated significantly with aesthetic judgement when knowledge of art was controlled. Regression, or the ability to regress to less mature modes of thought, therefore relates to aesthetic judgement but does so by virtue of knowledge of art. Scanning, or tendency towards broad deployment of attention, relates significantly to aesthetic judgement regardless of knowledge of art.

Results of this study are reported in Table 39. The two cognitive styles which Child found to relate to his measure of aesthetic judgement also relate to form and movement responsiveness. The movement comparison score relates significantly to regression.

The free form response score relates significantly to regression and scanning, whereas the free movement scores relates to scanning.

The form percentage score relates significantly to regression, the movement percentage score to scanning.

Table 39

## Spearman Rank Correlations (Rho) for Colour, Form and Movement Responsiveness to Paintings and Cognitive Style

| Cognitive Style                  | Comparison |        |                     | Free Response       |                     |                      | %      |                     |                     |
|----------------------------------|------------|--------|---------------------|---------------------|---------------------|----------------------|--------|---------------------|---------------------|
|                                  | C          | F      | M                   | C                   | F                   | M                    | C      | F                   | M                   |
| Field Independence               | + .199     | + .168 | - .065              | - .257              | + .115              | + .265               | + .155 | + .143              | + .331              |
| Regression in service of the ego | + .265     | + .185 | + .411 <sup>x</sup> | - .103              | + .409 <sup>x</sup> | - .086               | + .072 | + .408 <sup>x</sup> | + .185              |
| Flexibility                      | - .094     | - .146 | + .076              | - .364              | + .257              | + .342               | - .103 | + .157              | + .153              |
| Narrowness of Equivalence Range  | + .139     | + .008 | + .161              | + .446 <sup>x</sup> | + .240              | + .155               | + .167 | + .035              | + .126              |
| Scanning                         | + .280     | + .043 | + .266              | + .323              | + .549 <sup>x</sup> | + .608 <sup>xx</sup> | + .183 | + .274              | + .506 <sup>x</sup> |
| Sharpening                       | - .051     | - .071 | + .184              | + .067              | + .321              | - .138               | + .103 | + .109              | + .265              |
|                                  | N = 16     |        | xP = .05            | xxP = .01           |                     |                      |        |                     |                     |



If correlation with the cognitive styles which Child found to relate to aesthetic judgement is further evidence of colour, form and movement responsiveness reflecting appropriate response, then results furnish this evidence. Moreover, the scores which showed the highest deviation from chance expectation (see above) also relate most significantly to scanning and regression. Again two patterns emerge. The free response scores (and the percentage) show the most consistent correlations with scanning and regression. Only the movement comparison score relates to regression. Also, the movement responsiveness measures most often relate to scanning or regression, then form responsiveness. Colour responsiveness scores show no relation to any measure Child found to relate to aesthetic judgement. The free colour response score did relate to narrowness of equivalence range, but interpretation of this result must await further elucidation of the overall meaning of colour responsiveness.

## CHAPTER 5

### SUMMARY AND CONCLUSIONS

Conclusions deriving from this study involve the three major themes which will be amplified in this chapter. The first part of this chapter comprises a summary of findings relating to the colour form and movement responsiveness scores which, in correlating with personality factors, substantiated Rorschach hypotheses. Only one hypothesis, that relating to form and introversion, failed to receive uniform confirmation. An explanation of this is attempted. The results of this study suggest that hypotheses deriving from studies using Rorschach can be applied successfully to colour form and movement responses to paintings.

Results relating to the percentage scores, designed to reflect "appropriate" response to specific paintings contrast with results relating to other colour form and movement responsiveness scores. The percentage scores were not found to relate consistently to personality variables. This study aimed to clarify the meaning of a response to that refined category of visual stimulus called a painting. The second part of this chapter, examines the percentage score with a view to discovering how an aesthetic response (or response to visual art) differs from response to other perceptual stimuli.

The third part of this chapter attempts to interpret the complex mosaic of correlations emerging from this study in the light of Klein's theory propounded in Chapter 1.

The review of Rorschach studies to date (Chapter 2) showed that hypotheses relating to colour, form and movement responsiveness and personality have been substantiated using Rorschach as a measure of perceptual style and using tests specifically designed to measure colour-form dominance and movement threshold. Moreover, hypotheses concerning colour and personality variables have been substantiated using perceptual stimuli even further removed from Rorschach ink blots, — like use of colour in painting (Alschuler and Hattwick (1947)). Only one hypothesis, that linking form responsiveness and introversion, did not receive much substantiation in past studies with the exception of those studies which used colour-form dominance tests.

This study was in part an attempt to replicate the findings of earlier studies using tests of colour-form dominance and movement threshold. It also involved the administration of Rorschach to a small subsample of subjects, and results pertaining to Rorschach in relation to personality variables were considered in relation to previous work using Rorschach.

However, the main aim of this study was to extend Rorschach hypotheses to measures of colour form responsiveness in relation to particular paintings. Also, the aim was to relate these, and personality traits to measures of preference for paintings belonging to those particular movements in art which relied on colour form and movement for their effect and incorporated emphasis on these particular aspects as part of their aesthetic (Chapter 3, Section 4).

The first question to be answered by a study of this nature concerns the amount of support assembled for the hypotheses relating perceptual style to personality, especially in relation to colour form and movement responsiveness to paintings.

Results derived from use of the Rorschach test evinced much support for the hypotheses. Though not all were substantiated, all correlations were in the predicted direction. These results were interpreted as in line with studies in the past which have reported similar findings. Confirmation was found for the hypotheses linking colour responsiveness and extraversion, form and introversion, movement and control of emotionality, and movement and introversion.

All hypotheses were confirmed when the measures of perceptual style were tests of colour-form dominance and movement threshold. These results lend further weight to studies which have found similar confirmation of hypotheses using these types of test.

When measures of colour responsiveness to Expressionist, form to Cubist and movement to Futurist paintings were related to personality variables, the results varied depending on the score derived, but hypotheses received a great deal of substantiation.

The first measure of perceptual style in relation to paintings was derived from a situation in which the subject compared groups of three paintings and stated in which way two were alike and one different. When subjects compared Expressionist, Cubist and Futurist paintings in terms of colour, form and movement, respectively, the response was scored colour, form or movement. The scores derived from this situation — the comparison scores — were then correlated with personality variables. All hypotheses were confirmed, with the exception of hypothesis 2 relating form responsiveness to introversion.

The second measure of perceptual style was derived from a situation in which subjects looked successively at colour slides of paintings presented in random order: the 15 slides comprised 5 Expressionist, 5 Cubist and 5 Futurist paintings. A colour, form or movement response was scored when a subject mentioned colour form and movement apropos Expressionism, Cubism and Futurism respectively. This comprised the free response score. The pattern of hypothesis confirmation for these scores was remarkably like that for the comparison scores. All hypotheses were confirmed except two. These were hypothesis 2 relating form responses to social introversion and hypothesis 2a relating movement responses to intelligence, imagination and creativity. The latter, however, received some support from the correlation which emerged between movement responsiveness and B (16PF) intelligence. This was in the predicted direction and just failed to reach the  $P = .05$  level of significance.

It would seem then, that the hypotheses outlined in this study and confirmed when using Rorschach in past studies, and tests of colour-form dominance and movement threshold hold remarkably well when measures of colour form and movement responsiveness to paintings are related to personality factors. The exception is the hypothesis relating form responsiveness to introversion. The dearth of studies relating form responses on Rorschach to introversion may well belie the viability of this hypothesis. Perhaps

failure to confirm this hypothesis has not been uncommon. That this hypothesis was confirmed in relation to tests of colour-form dominance may be because on such tests, a person if not colour dominant, must be form dominant, and vice versa. Hence, if extraversion relates to colour dominance, introversion must necessarily relate to form dominance. When using Rorschach, and in relation to paintings, this is not the case; a person may produce equally, many colour and many form responses. Hence there is no reason why, on these measures, a colour-responsive extravert should not also produce many form responses. This would account for failure to confirm the hypothesis linking introversion and form responsiveness.

Another explanation of why this hypothesis failed to stand up to testing may be that the correlation of form responsiveness and extraversion in fact reflects a relationship of form and stability. This could be the case if measures of extraversion also reflected stability. The fact that Cattell's factor H (16PF) *harria*, positively loads the second-order factor extraversion or *exvia*, and negatively loads the second-order factor of anxiety, attests to the connection of extraversion and stability. Eysenck (1964) reports a correlation of between  $-.1$  and  $-.2$  for the MPI E (Extraversion) and N (Neuroticism) scales for normal groups, ranging to about  $-.4$  for neurotic groups. This also attests to the relationship of extraversion and stability.

The measures of extraversion to which form responsiveness related were often found to correlate with measures of stability. Factor A (16PF) *affectothymia* related negatively to O (16PF) *guilt-proneness*; F (16PF) *surgency* related negatively to Q<sub>4</sub> (16PF) *ergic tension*; Pe (DPI) *exhibitionism* related positively to H (16PF) *harria*. It is plausible that a measure of introversion which does not measure anxiety or instability may well relate to form responsiveness. For example, the Lüscher test (which was included in the analysis but reported alongside subsidiary results in Appendix d) may give a relatively anxiety free measure of introversion. Introversion, as measured by Lüscher profile 1, related to form comparison scores positively and significantly.

Regardless of how valid this explanation may be, the fact remains that the hypothesis linking form responses and introversion fails to gain support when it is related to form responsiveness to Rorschach and to Cubist paintings. The other hypotheses relating to perceptual style are consistently supported when it is measured vis-à-vis Rorschach and paintings. That hypotheses can be extended to complex stimuli like paintings lends a great deal of weight to hypotheses derived from Rorschach studies.

In contrast to the results derived from free response and comparison measures of perceptual style are those relating to the percentage measures of colour, form, and movement responsiveness. These scores reflected appropriate response to Expressionism, Cubism and Futurism in the free response and comparison situations with total number of colour form and movement responses to all paintings (Expressionist, Cubist and Futurist) controlled. They therefore reflect direct, specific and appropriate responses to paintings when appropriateness is defined as response to those aspects of the painting considered most

essential according to art historians, and the artists themselves. In the case of the paintings used in this study, colour, form and movement were considered of paramount importance with respect to Expressionism, Cubism and Futurism respectively (see Chapter 3). High scores for colour form and movement in the free response and comparison measures could be achieved by general disposition to react in terms of colour, form and movement and hence achieved on a hit-and-miss basis. This could not be the case for percentage scores which reflect specific and appropriate colour form and movement responsiveness with general colour, form and movement responsiveness controlled.

When the percentage scores were related to personality variables, only two hypotheses were confirmed. These were hypothesis 1 concerning colour and emotionality and hypothesis 2a relating movement responsiveness to intelligence and imagination. Hypothesis 2 relating colour responsiveness to extraversion received marginal support from the correlation of .150 which emerged between colour % and factor A (16PF) affectothymia. This approached significance at the .05 level.

Hence though the form and introversion hypothesis had not been substantiated with the other scores, and was similarly not supported with the percentage score, four hypotheses which were previously confirmed using other measures of colour form and movement responsiveness failed to be confirmed when the measure of colour form and movement responsiveness was the percentage score. These were hypothesis 2 colour and extraversion, hypothesis 1 form and control, hypothesis 1 movement and control, and hypothesis 2b movement and introversion.

It is noteworthy that hypothesis 1, relating colour to emotionality, has received confirmation above all other hypotheses using a variety of measures. The studies in question used colour-form dominance tests, Rorschach and response to use of colour in paintings as well as colour preference (Alschuler and Hattwick, 1947; Cerbus and Nichols, 1963; Barrett and Eaton, 1946). It was also confirmed when the measure of colour responsiveness was colour percentage.

Also, the hypothesis relating movement responsiveness to intelligence, imagination and creativity has been confirmed most often in this study, in relation to intelligence. The comparison score related significantly to intelligence, and the free response score related at a level just below significance. Similarly, the movement percentage score was found to relate to B(16PF) intelligence.

Hence, although two hypotheses are confirmed, when the measure of colour, form and movement responsiveness is a percentage, these two are the ones most likely to receive support if consistency of past confirmation is anything to predict from.

It would seem that while support for the hypotheses relating perceptual style to personality variables is forthcoming when the measures of perceptual style are free response and comparison, it is not when the measures are percentages. Further analysis of the differences between these scores furnishes reasons for the occurrence of this result.

The free response and comparison scores reflect response to colour, form and movement in

Expressionism, Cubism and Futurism respectively; they also reflect general responsiveness to colour form and movement in all paintings. Obviously, general propensity to respond, for example, to colour in all paintings would produce a high colour score exclusively in relation to Expressionist paintings. Anything within this score which actually did correspond to a measure of appropriateness (as defined in Chapter 3, Section 4) would be inflated, at least, by general indiscriminate colour responsiveness. It was therefore suggested that the free response and comparison scores, while reflecting appropriate response to paintings, could well reflect appropriate responses achieved on a hit-and-miss basis. Support for this conclusion is derived from the correlations tabulated in Table 40. The colour form and movement mentioned scores reflect total number of colour form and movement responses to all paintings, regardless of the movement in art to which they belong. Table 40 shows that in each case the free response and comparison measures of appropriate responsiveness correlate highly and significantly with total number of indiscriminate colour, form and movement responses or the "mentioned" scores.

Table 40

Intercorrelations (Product-Moment) for Colour Form and Movement Total Response Scores (mentioned) and Free Response and Comparison

|               | Colour<br>Mentioned   | Form<br>Mentioned     | Movement<br>Mentioned |
|---------------|-----------------------|-----------------------|-----------------------|
| Comparison    | + .789 <sup>xxx</sup> | + .816 <sup>xxx</sup> | + .830 <sup>xxx</sup> |
| Free Response | + .228 <sup>x</sup>   | + .487 <sup>xx</sup>  | + .609 <sup>xxx</sup> |
| x = .05       | xx = .01              | xxx = .001            | N = 71                |

If it is general propensity to respond to colour, form and movement regardless of stimulus which relates to personality variables, then it is to be expected that the colour, form and movement mentioned scores should also relate to hypothesized personality factors. Tables 46, 47 and 48 in Appendix A show that this is the case. All hypotheses, with the exception of two, are confirmed in relation to the mentioned scores. Moreover, hypothesis 1 relating to movement responsiveness and control is supported by the negative correlation which emerged for movement mentioned and factor L (16PF) protension. This was in the predicted direction and approached significance at the .05 level. Hypothesis 2, relating form-responsiveness to introversion, fails to gain support as it did in relation to the free response and comparison scores, which were also found to relate to extraversion scales in the opposite direction to that predicted.

Table 41 shows the correlations which emerged for the mentioned and percentage scores. Colour mentioned and colour percentage relate negatively and the correlation is highly significant. Form mentioned and form percentage show an insignificant relationship and the correlation for movement mentioned and movement percentage scores, while approaching significance fails to reach the  $P = .05$  level.



Table 41

## Product Moment Correlation Coefficients for the Mentioned and Percentage Scores

|          | Mentioned            |                      |          |
|----------|----------------------|----------------------|----------|
| %        | Colour               | Form                 | Movement |
| Colour   | — .439 <sup>xx</sup> |                      |          |
| Form     |                      | + .006               |          |
| Movement |                      |                      | + .191   |
| P        | .05 when $r = .196$  | <sup>xx</sup> P .005 | N = 71   |

The percentage scores therefore differ from the free response and comparison scores in so far as they measure colour, form and movement responsiveness that is specific to relevant paintings comprising Expressionism, Cubism and Futurism.

It would seem that while general indiscriminate colour, form and movement responses relate to hypothesised personality factors, specific appropriate response to paintings, as reflected by the percentage scores, does not. If there are concomitant factors for response to the most salient features of paintings, they are not personality factors.

The form and movement percentage scores relate to regression and scanning respectively. These correlations indicate that an appropriate response relates to factors which are cognitive. These cognitive factors involve controlled regression to less mature forms of thought (regression) and the ability to concentrate on a focal point while remaining aware of peripheral events (scanning). The relationship of the percentage scores to scanning is congruent with Gombrich's belief (1960) that the aesthetic response is a refusal to "gate" or peripherally process data.

Further consideration of the factors which correlate with the percentage scores confirm its relationship with cognitive factors (tables 49, 50 and 51, Appendix B). The movement percentage score was found to relate to B (16PF) intelligence. The form percentage score also related to B, and the colour percentage score was found to relate to M (16PF) antia and I (16PF) premsia, both indicative of imaginative capacity (see Appendix B). None of the latter three correlations was hypothesised. The scales B, M and I are indicative of absorption in inner creations, creative interests, imagination and intuition, as well as intelligence.

It is concluded therefore that the percentage score relates to cognitive factors like imagination, intelligence, regression and scanning. With the exception of the colour percentage score, (which relates to Q<sub>4</sub> (16PF) ergic tension) it does not relate to social responses or personality traits.

These correlations elucidate the nature of the percentage score in so far as they imply that individuals who respond exclusively to colour in an Expressionist painting (as opposed to other paintings) are characterised by an above-average amount of imagination, intuition and cognitive flexibility.

The fact that the colour percentage score (for example) reflects an exclusive response to Expressionism in terms of colour can be stated another way. The percentage scores do not reflect a general perceptual style; the colour percentage score does not in other words, reflect a tendency to respond to



any perceptual stimulus in terms of colour. The fact that the percentage scores do not correlate with the mentioned scores (Table 41) or any other basic measure of perceptual style — Rorschach, colour-form dominance or movement threshold (tables 12, 13 and 14) — attests to this.

The appropriate response under consideration is one which involves response to the most pertinent aspects of a painting. It implies cognitive appraisal of a painting in order to produce such a response. The fact that the correlates of this response are also cognitive adds weight to the conclusion that the appropriate response is the product of intellectual ingiving, discrimination and reflection.

Such a conclusion cannot, of course, be definitive. Interpretation of the nature of the appropriate response in terms of correlates must be inferential. Correlation is not tantamount to causality. In the present instance, it has been said that the appropriate response may be characterised by cognitive and intellectual factors in so far as the type of individual producing this response scores highly on tests which measure these factors. There is no absolute justification for inference of this type. It is, however, expedient and scientifically acceptable to interpret a consistent and lawful relationship (like that of a correlation) by positing an intervening variable which governs the covariance. It is here that Klein's model, outlined in Chapter 1, is pertinent. Applying this model involves specifying the perceptual response (appropriate response, in terms of percentage score) and its correlate (the cognitive factor of scanning, for example) and postulating an intervening variable or *anschavung* to account for this relationship. The nature of the *anschavung* is determined by the nature of the covariant factors.

Specifying the nature of the appropriate response involves stating that it is a response which weeds out pertinent stimuli — colour, form, or movement, depending on the painting — from a complex array. The cognitive style of scanning involves the ability to pick out the focal point of complex stimuli, while remaining aware of peripheral events. The concept of intelligence (albeit controversial) involves convergence upon a correct or acceptable solution. The perceptual response (appropriate response) and covariant cognitive factors seem therefore to have in common an ability to detect the most salient features of a complex array. The *anschavung* governing the correlated responses may therefore be characterised by a factor facilitating discrimination of the most salient and essential features of a configuration (perceptual, verbal or mathematical).

Although workable, Klein's model still involves a gap in deduction in so far as all underlying sub-systems must be inferred. This type of inference does not contravene the standards of experimental methodology, but it does pose problems when information about the nature of the two variables under consideration is scant and the particular correlation has not been repeatedly substantiated. This problem cannot be overcome until the variables have been studied in many contexts using a variety of measures, so that hypotheses as to the nature of the intervening variable or *auschavung* can be reduced and refined.

It is maintained, however, that Klein's theory is particularly apposite in the interpretation of those findings which corroborate previous research and involve variables which have been extensively explored

in previous research. As noted below, it is in the application of Klein's theory to variables, which this study is one of the first to explore, that ambiguity of interpretation makes conclusions very difficult.

In order to make the multiform correlations furnished by this study intelligible, it is proposed that Klein's model be used. Given that personality is the overall organising principle governing the expression of social, perceptual and cognitive factors, correlations between these factors can be used to illuminate the nature of the various systems or *anschauungen* organising them.

Correlations of the measures of colour responsiveness reveal three major types of response to colour reflected by the following groups of scores: colour dominance (Keehn) and its correlate, the colour comparison score; Rorschach colour responsiveness, which correlated with preference for Expressionist paintings; and the free colour response and percentage scores. These intercorrelate with various personality and cognitive factors.

Colour dominance (Keehn and Thurstone) was formed to relate negatively to G (16PF) superego strength, and positively to Ou (DPI) unconventionality, and L (16PF) protension. The colour comparison score was found to relate to Oi (DPI), impulsivity and Ou (DPI) verbal aggression, and negatively to Ao (DPI) conservatism. The colour dominance and comparison scores also related to measures of extraversion, A (16PF) affectothymia, Q<sub>2</sub> (16PF) group dependence, and SA (DPI) social activities. Neither score related to any measure of cognitive style. Scrutiny of the related personality scales reveals that they all reflect (with the possible exception of L (16PF)) the trait of impulsivity or need for immediate need gratification. Cattell (1970) says, for example, that low scores on G (16PF) reflect "emotional and impulsive behaviour". The DPI scales of Oi, Ov and Ou represent impulsivity as do low scores on Ac.

If it is hypothesised that these personality and perceptual factors are controlled concomitantly by one system or *anschauung* clarification of any factors they have in common with illuminate the nature of this *anschauung*. Examination of the colour dominance tests of Keehn and Thurstone reveals that they demand an immediate response. Subjects were asked to give their first reaction to Keehn's designs and the Thurstone test bands are projected for only 1.5 seconds. Similarly, when subjects were asked to compare the paintings in the comparison situation, their responses were brief. They were asked simply to state the way in which two paintings were alike and one was different.

Therefore these measures of colour responsiveness elicit a response which is instantaneous. It is this immediacy of response which the factors under consideration share. Impulsivity in a social context relates to a perceptual response which is also immediate and allows no time for integration within the percept of stimulus properties other than colour. The system or *anschauung* governing the two types of impulsivity (perceptual and social) can be characterised as one involving immediacy of response or instant discharge of energy.

Review of the correlates of the second type of colour responsiveness reveals a mixed bag. Rorschach colour responses related to O (16PF), anxiety which is acted out in terms of phobic reactions. It also

related to F (16PF) surgency. Preference for Expressionist paintings (the correlate of Rorschach colour responses) related to G (16PF) indicating a degree of impulsivity. Subsidiary results (Appendix B) show that preference for Expressionism also related negatively to two other 16PF scales: Q, radicalism, and M, antia, indicating a "down to earth attitude", realism, limited capacity for abstract thought and lack of imagination. It also related negatively to the cognitive style of sharpening (table 45). This means it relates to the pole of this dimension indicating lack of awareness of the uniqueness of experience over time — a "levelling" attitude, or global view of events. Therefore preference for Expressionism relates to a holistic group of experience in its totality, without regard for detail, and realist concrete thought.

If Rorschach colour responsiveness and liking for Expressionist paintings are to have anything in common with their covariant personality traits, there must be something in these types of response to colour which is superficial and holistic.

There is evidence that a response to colour in Rorschach is not a response to colour per se, but a response to the holistic properties of a coloured area. Keehn (1955) found that Rorschach colour responses did not relate to his other tests of colour responsiveness. Thurstone (1944) on factor analysing a large battery of perceptual tests, concluded, like Keehn, that the Rorschach colour response had more in common with tests which measured a whole-part response. Results of this study suggest that Rorschach colour responsiveness does not relate to any other colour response except liking for colourful paintings. Liking for such paintings may well depend on preference for stimuli which facilitate a synthetic or global response and are not factured by emphasis on form and line.

The holistic grasp of experience inherent in a response to colour which depends on its superficial synthetic qualities also permeates the down-to-earth attitude reflected by M and Q<sub>1</sub> (16PF), the cognitive style of levelling, extraversion and the open expression of emotionality reflected in the F, G, and O scales of the 16PF. This implies that the system governing these responses is one which organises superficial, general responses. In a perceptual situation it manifests itself in terms of response to the global qualities of colour; in a context demanding cognitive appraisal it manifests itself as a synthetic attitude which is at once superficial and all-inclusive; in a social context it is revealed in terms of extraverted display of emotionality, which is often acted out as a phobia (O, 16PF).

The third type of colour responsiveness is that reflected by the free colour response and percentage scores. Both scores correlated with measures of impulsivity and emotionality (C (16PF) and Q<sub>4</sub> (16PF) respectively. Both scores also related to cognitive factors. The free colour response score related to narrowness of equivalence range indicating a tendency to discriminate between stimuli which differ only slightly. The percentage score showed subsidiary correlations with the M and I scales of the 16PF, indicative of rich imagination and sensitive intuition.

In contrast to the previous constellation, these perceptual and cognitive factors seem to have in common a factor involving the capacity to discriminate effectively between stimuli. The percentage

scores does not reflect response to colour per se but response to colour as a factor which distinguishes one painting from another. This relates to imaginative capacity and flexibility (M (16PF)). The free response score, correlates with the tendency to respond to small differences between stimuli. The sensitivity to nuance involved in these perceptual responses is probably paralled in a social context in terms of emotional sensitivity (C and Q<sub>4</sub> (16PF)). It may be inferred that the *anschauung* governing the third type of colour response is one which involves sensitivity, imagination and discrimination.

So far the application of Klein's model to the results of this study implies three types of *anschauung* or system organising the expression of individual differences. The operation of all three *auschauungen* results in a perceptual response which is colour determined. The way this response comes about, however, is dependent on a system-specific *modus operandi*.

The first *anschauung* precipitates immediacy of response, resulting in impulsive and emotional behaviour in a social context, and in a perceptual context, a response to that aspect of a perceptual configuration which had immediate impact — colour. The second system involves a synthetic holistic reaction to the global qualities of a stimulus — this synthetic attitude results in a colour response in a perceptual context and a concrete superficial response (emotionality, phobia) in a social context. In contrast, the third *anschauung* is discriminating, analytic and sensitive. This is manifest in a social context in terms of emotionality or oversensitivity, and perceptually as a response to colour as a factor discriminating one painting from another.

For form, like colour, there would seem to be three main types of responsiveness: form dominance (Keehn and Thurstone); form responses to Rorschach which relates to form comparison scores and preference for Cubism; and that reflected by the free form response and percentage scores.

Form dominance did not relate to any other measure of form responsiveness. Review of its correlation with personality traits, reveals that this type of form responsiveness relates to non-impulsivity (as reflected by DPI measures) non-emotionality (as reflected by L (16PF)), and social introversion (Q<sub>2</sub> (16PF) and SA (DPI)).

Form responsiveness has not been submitted to as much investigation as the comparatively more intelligible colour response. It is therefore more difficult to delineate just what a form response has in common with covariant personality traits. Writers like Schachtel (1941) and Rapaport (1946) seem to agree that the form response involves inhibition of immediate response. As reported previously, (Chapter 4) Thurstone (1944), having found that colour dominance loaded a speed of perception factor, concluded that form responders are probably slower at perceiving. If it is the case that a form response involves initial inhibition, then it is clear that it shares this factor with personality traits described above.

The system concomitantly governing manifestation of form dominance and personality factors would therefore seem to be one involving inhibition and delay of response. It was argued above that colour-form dominance tests allow minimum delay of response. This implies that the production of a

form response to these tests involves a delay of response which is minimal. The illustration which characterises the *anschauung* controlling this response is therefore best described as reflexive.

The second type of form response is mirrored by Rorschach, comparison scores and preference for paintings which emphasise form (Cubist). Like the first type of form responsiveness, the second also correlates with personality factors indicative of inhibition. The common factor shared by perceptual and personality factors is delay of response. This suggests that the *auschauung* governing them is again one involving inhibition of response.

Again, lack of information as to the meaning of a form response hinders interpretation. However, it is plausible that the production of a form response to Rorschach, when comparing paintings, and preference for form, may involve a little more time than that permitted in relation to form dominance tests. The inhibition involved in the response may therefore depend less on reflexive delay and more on hesitation due to appraisal and analysis of the stimulus.

Review of further correlates of this second type of form response reveals cognitive and intellectual factors. Rorschach form responses related to B (16PF), intelligence (Appendix B). Preference for Cubism related to the cognitive styles of sharpening or analytical attitude and flexibility or ability to change mental orientation (table 45). The latter also related to T1 (DPI) interest in tactile qualities.\*

A perceptual response to form therefore (in terms of Rorschach, comparison of paintings and preference) may have in common with correlated personality factors an inhibition of response which is due to analysis of pertinent factors.

The *auschauung* concomitantly controlling the second type of form responsiveness and the personality trait of emotional reserve may therefore be characterised in terms of delay of response which depends on intellectual analysis of the situation.

The third type of form responsiveness is that reflected by the free response and percentage scores. These relate to measures of emotional control: O (16PF) and Q<sub>3</sub> (16PF). They also relate to cognitive factors. The form percentage score relates to B (16PF) intelligence. Both scores relate to the cognitive style of regression and the percentage score relates to scanning.

In this study, the free form response score showed one of the largest deviations from chance expectation (Chapter 4), indicating that, with the percentage score it reflects direct and appropriate response to Cubism. These scores therefore, rather than simply reflecting a response to form per se, reflect a response to an aspect of a painting which endows it with inherent uniqueness. Probably the response to painting which is reflected in these scores is one which involves the articulation of a very complex perceptual configuration. Child (1965) characterised the aesthetic response as one involving "the ability to

\* These correlations of preference for Cubism are interesting in the light of the aesthetic of this art movement. It emphasised tactile qualities, the validity of multiple views of objects and the intellectual grasp of their nature.



attend simultaneously to various aspects of its stimulus value." The cognitive style of scanning involves the ability to deploy the attention broadly; regression involves the ability to maintain cognitive functions intact while employing other (less mature) modes of thought. Hence both cognitive styles imply modes of thought which would permit the simultaneous attention Child describes. The form responsiveness scores under consideration and their covariant cognitive styles may possibly have in common this ability to articulate a complex configuration. The *auschauung* or system involved in governing the third type of form response seems to be characterised by intellectual control of the articulation of complex events.

These results attest to three types of *auschauung* organising the expression of individual differences. They have in common control of response — perceptual, social or cognitive. The first *auschauung* involves reflexive inhibition of response, resulting in a social context in emotional control and social introversion. In a perceptual context this is manifest in terms of response to perceptual stimuli which demand response to colour or form in an either-or fashion. Inhibition of response delays reaction long enough to result in a response to form. The second type of *auschauung* involves a delay of response more dependent on analysis and appraisal of the situation than on reflexive inhibition. This system is manifest in social situations in terms of emotional reserve. In relation to cognitive and perceptual stimuli it produces an analytic response, resulting in a perceptual situation in a response determined by careful appraisal of the stimulus properties and response to form. This *auschauung* is mirrored in preference for stimuli which emphasise formal qualities and an interest in things of tactile and creative significance. The third *auschauung* is more complex. It involves controlled articulation and appraisal of complex events — the ability to discriminate the focal element of a complex stimulus and simultaneously attend to peripheral events. This results in complex cognitive analysis, and a discriminating appropriate response to Cubist paintings. Such articulation probably involves the time delay which is paralleled in a social context by emotional control.

Movement responsiveness scores form two constellations. The first group comprises low movement threshold, movement response to Rorschach, movement comparison scores and preference for Futurism. The second comprises free movement response and percentage scores. Correlations of the two groups of movement responsiveness scores closely parallel one another. Moreover, the movement scores also relate to variables which correlate with the second and third types of form responsiveness. Interpretation and differentiation between the systems governing the various types of movement and form responses therefore begins to pose problems. Some indication of the differences between the systems emerges from the following analysis, but full clarification entails detailed research involving examination of related variables over a much wider field.

The first type of movement responsiveness related to non-emotionality and non-impulsivity (tables 20, 25 and 26), and all, except preference for Futurism related to social introversion. All measures showed some relation to cognitive factors. Movement threshold related to I (16PF) sensitivity. Subsidiary

correlations (Appendix B) showed that Rorschach movement responses related to  $Q_1$  (16PF), experimental analytic thought. Movement comparison scores related to  $Q_1$  and B (16PF) intelligence.

The movement comparison score related to regression. This was the only comparison score to relate to a cognitive style. Further analysis of the movement scores, however, revealed that they all related to either regression or scanning — the two cognitive styles which Child found to relate to his measure of aesthetic judgement. Movement threshold related to field independence and regression (table 42). Of all the mentioned scores, only the movement mentioned score related to a cognitive style, and this was scanning (table 43). Preference for Futurism also related to scanning. In contrast, it was found that colour-form dominance did not relate to any cognitive style (table 45).

Table 42

## Spearman Rank Difference Correlations (Rho) for Movement Threshold and Cognitive Style

| Cognitive Style                  | Rho                 |
|----------------------------------|---------------------|
| Field Independence               | + .556 <sup>x</sup> |
| Regression in Service of the Ego | + .627 <sup>x</sup> |
| Flexibility                      | + .163              |
| Narrowness of Equivalence Range  | — .039              |
| Scanning                         | + .003              |
| Sharpening                       | + .127              |

x P = .05

xx P = .01

N = 16

Table 43

## Spearman Rank Difference Correlations (Rho) for the Mentioned Scores and Cognitive Style

| Cognitive Style    | Mentioned Score |        |                     |
|--------------------|-----------------|--------|---------------------|
|                    | Colour          | Form   | Movement            |
| Field Independence | — .104          | + .291 | + .100              |
| Regression         | + .145          | + .248 | + .101              |
| Flexibility        | — .190          | — .109 | + .203              |
| Equivalence Range  | — .142          | — .092 | + .391              |
| Scanning           | + .365          | + .301 | + .590 <sup>x</sup> |
| Sharpening         | — .098          | + .392 | — .063              |

x P = .05

N = 16

Table 44

## Spearman Rank Correlations (Rho) for Preference for Paintings and Cognitive Style

| Cognitive Style                  | Preference          |                     |                     |
|----------------------------------|---------------------|---------------------|---------------------|
|                                  | Expressionism       | Cubism              | Futurism            |
| Field Independence               | — .040              | + .210              | — .198              |
| Regression in Service of the Ego | — .393              | — .119              | — .334              |
| Flexibility                      | — .207              | + .449 <sup>x</sup> | + .106              |
| Narrowness of Equ. Range         | — .038              | + .043              | + .192              |
| Scanning                         | — .233              | + .089              | + .440 <sup>x</sup> |
| Sharpening                       | — .449 <sup>x</sup> | + .407 <sup>x</sup> | — .151              |

x P = .05

N = 16



Table 45

## Largest Differences (Kolmogorov-Smirnov) for Colour-Form Dominance and Cognitive Style

| Cognitive Style                  | Differences |
|----------------------------------|-------------|
| Field Independence               | .125        |
| Regression in Service of the Ego | .325        |
| Flexibility                      | .500        |
| Narrowness of Equivalence Range  | .425        |
| Scanning                         | .250        |
| Sharpening                       | .375        |

N = 16

It would seem then that all the measures of movement responsiveness except Rorschach\* relate to the cognitive styles of scanning or regression. It is significant that movement responsiveness as reflected by the first group of movement scores relates to the measures which Child found to relate to aesthetic judgement. Child also found a relationship between his measure of aesthetic judgement and low movement threshold by the Barron Inkblots. Therefore judgement of the better of two paintings which is in line with that of experts relates to the tendency to see movement in ambiguous stimuli. This finding is congruent with the correlation between the movement comparison scores of this study and the Lüscher profile indicative of aesthetic sensitivity (see Appendix D).

It is difficult to determine just what inheres in a measure of aesthetic judgement as to the relative merit of a work of art which correlates with that of experts. Delineation of the processes involved in the production of a movement response is also far from conclusive. By definition, a movement response is one which enriches a static configuration with projected movement. This perceptual process implies a rich store of cognitive associations, imagination and perceptual flexibility. A movement response probably involves delay in order to bring these processes to bear. It correlates with factors indicative of emotional control, sensitivity, imagination and ability to articulate and organise complex cognitive events. These factors, moreover, have been found to relate to the ability to make discerning evaluations of works of art in line with those of experts.

Review of the factors a movement response and its correlates have in common suggests that the *anschauung* governing such factors involves the ability to control and articulate complex stimuli through imagination, divergent thought and flexibility.

The second type of movement responsiveness as reflected by the free response and percentage scores related to factors which have a lot in common with those relating to the first. The correlations are fewer. The free movement response score related to measures of social introversion and non-impulsivity (tables 25 and 27). It related to intelligence (B (16PF)) and the cognitive style of scanning. The percentage score related only to intelligence and scanning. Much that was said in relation to the first type of movement responsiveness is pertinent here. This second type of movement responsiveness

\* Rorschach and Child's inventory was given to separate samples and therefore could not be related.

does not relate, however, to factors indicative of imagination and experimental thought. The *auschauung* hypothesised in relation to the movement percentage and free response score is primarily one involving the ability to articulate and analyse a complex field of events. This is manifest socially in terms of behavioural control and withdrawal, in a cognitive context in terms of scanning, and in a perceptual context the discernment of movement as a unique quality inherent in and distinguishing one painting from another, rather than an indiscriminate response to movement.

The difference between the first and second types of movement responsiveness is in terms of specificity. The first type (reflected in responses to ink blots and comparison of paintings) involves a general tendency to enrich a static stimulus with attributed dynamism. It relates to preference for stimuli which emphasise dynamic qualities. The second type of movement responsiveness — percentage and free response scores, which showed the largest deviation from chance expectation — involves the attribution of movement to those paintings which were designed to emphasise dynamic qualities. The *auschauung* governing the first type of movement responsiveness concomitantly governs the imaginative and experimental thought which would very plausibly correlate with a general tendency to attribute movement to stimuli. The delay inherent in the production of such a complex response is paralleled in a social situation by emotional reserve. If there is one term to describe the *auschauung* governing general propensity to respond in terms of movement it is inner preoccupation — resulting in imaginative responses (cognitive or perceptual) and delay in response to external stimuli.

The second type of movement responsiveness is probably governed by a system which does not involve production of an imaginative divergent response so much as one which converges on the discrimination of those properties which make a stimulus (in this case, a painting) unique. This convergent, or appropriate response relates to factors indicative of intellectual analysis and broad deployment of attention. In contrast to the first it does not involve factors indicative of experimental thought or regression. The *auschauung* governing the second type of movement responsiveness involves “convergence”, resulting in appropriate (not general) response in terms of movement, cognitive articulation of complex events and the control and delay integral to bringing the latter about.

Comparison of the correlational constellations involved in form and movement responsiveness reveals striking similarities. Each type of form and movement responsiveness relates to personality factors indicative of control. All, except the first type of form responsiveness, form dominance, relate to cognitive, intellectual factors. Different correlational combinations of intellectual factors, however, permit the discrimination of all form and movement response constellations except those reflecting appropriate response. To recapitulate: The first type of form response, form dominance, it was concluded, depends on an *auschauung* which reflexively inhibits responses to perceptual and social stimuli; the second type of form response is governed by an *anschauung* which also controls delay of response in a social context due to analytic appraisal of a situation; the first type of movement responsiveness involves an *anschauung*

which is characterised by inner absorption; this involvement in imaginal functions controls delay of response to social stimuli and imaginative experimental articulation of perceptual and cognitive stimuli. The third type of form response and second type of movement response, however, both embody a response to a specific aspect of a perceptual configuration (in this case a painting) which is direct and appropriate. Neither the form nor the movement responses reflected by the free response and percentage scores involve indiscriminate response to form and movement; both involve response to that aspect of a painting which distinguishes it from others. The free form and movement response and percentage scores relate to similar personality and cognitive factors. Therefore the *anschauungen* governing appropriate form and movement responses must both involve controlled delay of response through intellectual analysis converging on an appropriate response. These *anschauungen* reveal themselves in a social context in terms of emotional control, intellectually in terms of scanning or regression and perceptually in terms of the discrimination of form or movement as unique factors in a painting. Clarification of the mechanisms by which similar *anschauungen* should control a form response in one context (Cubist painting) and a movement response in another (Futurist painting) must await further research. This will involve studying other variables in relation to such responses, and closer scrutiny of the variables already studied.

Though Klein's scheme must be used cautiously, a model which posits systems or *anschauungen* which govern the expression of individual differences in perception, cognition, and personality traits is necessary for the explanation of findings which attest the consistent intercorrelation of such factors. A scheme of this sort helps to elucidate the nature of colour form and movement responses and the nature of the aesthetic response, which in this study was defined as such responses to specific paintings. To this end, and by way of conclusion the following impressions are offered with the proviso that they too are no doubt governed by the *anschauungen* comprising the author's idiosyncratic predilections.

Response to colour in a configuration would seem to be the result of factors which range from immediacy of response, through tendency to respond to global superficial qualities to a response dependent on sensitive analysis.

The types of colour responsiveness considered in this study are independent (they do not correlate). Separate systems must be hypothesised which govern responses to various characteristics of colour. A system which primes the individual to respond impulsively to stimuli precipitates open emotionality and extraversion in social contexts as well as a perceptual response to that aspect of a stimulus which first impinges on consciousness — colour. An *anschauung* governing behaviour in terms of realistic, practical considerations may operate by determining the most prominent organising principles of a situation, and hence direct a perceptual response based primarily on the unifying global aspects of a coloured area. An *anschauung* which controls sensitivity to the emotional impact of the environment may also control sensitivity to the special qualities inherent in a stimulus — perceptually, colour may thus be singled out and responded to as a unique, definitive element in certain paintings.

It would seem that propensity to respond to colour in a configuration is not necessarily the result of a general tendency to respond to colour per se, but the result of precipitousness or global response tendencies, or sensitivity to the impact of environmental stimuli.

Response to form in all contexts probably involves delay in response in order to allow the associative "cogwheeling" of which Rapaport (1946) speaks to operate. This delay of response to perceptual stimuli is paralleled in a social context by emotional control. Form responsiveness may be the result of a system which reflexively inhibits an immediate response, and hence permits just enough time to produce a form response in a situation which demands relatively swift reaction (colour-form dominance tests). It may equally be the result of an *anschauung* which facilitates intellectual analysis of a situation. Where a form response is the result of appraisal of the unique qualities of a Cubist painting — rather than of a general tendency to respond to form — it would seem to be controlled by an *anschauung* which involves complex intellectual analysis. Such analysis probably converges on an appropriate response to a work of art, the correct (accepted) solution to a problem, and appropriate "formal" behaviour.

A response to movement can be the result of general propensity to see movement in a static configuration. Such a response involves delay and control of response and also the imagination and sensitivity which a response involving the addition (or projection) of movement to a static configuration would entail. The *anschauung* governing such a response is probably best described as one involving inner absorption.

When a movement response is made specifically to Futurist paintings it is the result of factors which, like a form response to Cubism, involve rigorous intellectual analysis converging on an appropriate response. As outlined above, difficulty arises when an attempt is made to distinguish the *anschauung* governing an appropriate response to Cubism from that governing an appropriate response to Futurism.

It is relatively straightforward to derive hypotheses relating to the structures governing perceptual styles or general tendency to react to a stimulus in terms of colour form or movement. The nature of the *anschauung* which governs an individual's behaviour when he specifically responds to colour in Expressionism, form in Cubism or movement in Futurism is much more difficult to define. It is to be expected that inferences concerning systems governing response to paintings pose the greatest problem.

Attempts to define the aesthetic response are as intriguing as they are prolific. To Read (1931) it is the feeling of "harmony of formal relations . . . an escape from chaos". In the Marxist scheme of Fischer (1963) it is the dialectical opposition of the "Dionysian" desire to become part of the world and the "Apollonian" element of gaining distance from it. To the painter Ozenfant (1931) it simply "begins where reality ends". These expositions of the meaning of the aesthetic response contrast with the more rigorous operational definitions which form the basis of experimental inquiry. Of necessity, the criteria for aesthetic response used in scientific investigation tend to focus on a particular aspect of the aesthetic response, for example its motivation, or perceptual organisation. Irvin Child (1966) used congruence of

judgement of experts and subjects as to a painting's merit.

Response to painting in this study was measured by number of colour, form and movement responses to Expressionism, Cubism and Futurism respectively. It is maintained that the most pertinent measure of aesthetic response was that which controlled for general tendency to respond to colour, form or movement in a configuration and reflected response exclusively to colour in Expressionism, form in Cubism and movement in Futurism — the percentage score. The measures of response to painting were found consistently to relate to cognitive factors. Imagination and sensitivity related to colour response to Expressionism. Intelligence related to "appropriate" responses to form and movement in Cubism and Futurism. Cognitive styles related to all these responses to painting — narrowness of equivalence range to colour responses and scanning and regression to form and movement responses.

Unlike the various systems governing general tendencies to react typically to colour, form or movement in a configuration, the systems governing specific response to these factors when they comprise the most pertinent qualities of a painting must be described in relation to characteristic cognitive styles.

This study focused on a measure of the aesthetic response which was tailored to properties which make a painting exclusive. Results suggest that flexibility and openness to experience inhere in the system governing such a response. This conclusion has been echoed by various authors. Such factors are invoked in a compelling if somewhat florid injunction by Amedée Ozenfant: "Attune yourself to what emanates from a work of art like the antennae of a wireless set in response to a given frequency."

Gillian Wise (1971) proposed her definition of the aesthetic response when she said, "an object . . . is not a work of art except for those who possess the code for deciphering the message". Results of this study suggest that the key to this "code" resides in the individual systems or *anschauungen* which concomitantly control behaviour in relation to works of art and to stimuli demanding cognitive articulation. Detailed exposition of the nature of the aesthetic response awaits further research into the individual differences inherent in the cognitive complexities involved in the confrontation with a work of art.

## APPENDICES

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## APPENDIX A

## Total Number of Colour, Form and Movement Responses to Paintings — The Mentioned Score — and Personality

Total number of colour, form and movement responses to all paintings was calculated in order to be able to control for general responsiveness and calculate the percentage scores. That the free response and comparison scores also reflect general colour, form and movement responsiveness and not just appropriateness of response to Expressionism, Cubism and Futurism, is suggested by the correlations (especially for the comparison score) which emerge for these and the mentioned scores.

As measures of general colour form and movement responsiveness, it was considered valuable to relate these scores to hypothesised personality factors. Tables 46, 47 and 48 report the results.

## Colour

Hypothesis 1 was confirmed. Propensity to mention colour related to low scores on factor C (16PF) ego strength. It also related positively to Oi (DPI) impulsivity and Ov (DPI) verbal aggression.

Correlations for this score and L (16PF) protension and O (16PF) guilt-proneness were also in the predicted direction, though not significant.

Hypothesis 2 was confirmed. The colour mentioned score correlated positively with factor A (16PF) affectothymia.

Correlations with other measures of extraversion were also in the predicted direction, but not significant. These were: E (16PF) dominance F (16PF) surgency SA (DPI) social activities (Pe (DPI) exhibitionism and EI (DPI) initiative. Correlations with measures of introversion Q<sub>2</sub> (16PF) independence and Ws (DPI) seclusion were negative, but not significant.

Table 46

Rank Correlation Coefficients for Total Colour Responses  
(Colour Mentioned) and Personality

| Emotionality   |        | Extraversion   |       |
|----------------|--------|----------------|-------|
| Scale          | Rho    | Scale          | Rho   |
| C              | -.191* | A              | +.412 |
| G              | +.101  | E              | +.035 |
| L              | +.130  | F              | +.147 |
| O              | +.110  | Q <sub>2</sub> | -.071 |
| Q <sub>3</sub> | +.056  | SA             | +.037 |
| Q <sub>4</sub> | -.003  | Ws             | -.060 |
| Oi             | +.411* | Pe             | +.053 |
| Ov             | +.473* | EI             | +.016 |
| Ou             | +.142  |                |       |
| Ac             | -.292  |                |       |

\*  $P = .05$  $N = 71$  (16PF sample) $N = 23$  (DPI sample)



## Form

Hypothesis 1 was confirmed. The form mentioned score correlated negatively with O (16PF) guilt-proneness.

Other correlations approaching marginal significance were form mentioned and L (16PF) protension which was negative, as predicted and form mentioned and Q<sub>3</sub> (16PF) self-sentiment integration, which was positive, as predicted.

Hypothesis 2 was disconfirmed. The form mentioned score related positively to A (16PF) affectothymia, which is contrary to the prediction that form responsiveness relates to introversion.

Table 46

Rank Correlation Coefficients for Total Form Responses  
(Form Mentioned) and Personality

| Control        |        | Introversion   |        |
|----------------|--------|----------------|--------|
| Scale          | Rho    | Scale          | Rho    |
| C              | -.076  | A              | +.220* |
| G              | -.028  | E              | -.005  |
| L              | -.157  | F              | +.063  |
| O              | -.212* | Q <sub>2</sub> | -.024  |
| Q <sub>3</sub> | +.169  | SA             | -.055  |
| Q <sub>4</sub> | +.025  | Ws             | +.065  |
| Oi             | +.119  | Pe             | +.300  |
| Ov             | +.189  | EI             | +.097  |
| Ou             | +.117  |                |        |
| Ac             | -.064  |                |        |

\*  $P = .05$

$N = 71$  (16PF sample)

$N = 23$  (DPI sample)

## Movement

Hypothesis 1 was not confirmed. Movement mentioned did not relate to any scale indicative of control.

Some support is derived for the hypothesis from the negative correlation found between movement mentioned and Factor L (16PF) protension, which though not significant was in the predicted direction and approaching the  $P = .05$  level of significance.

Hypothesis 2a was confirmed. Movement mentioned correlated positively with B (16PF) intelligence.

Hypothesis 2B was confirmed. The movement mentioned score related negatively to E 1916 PF) dominance.

Table 48

Rank Correlation Coefficients for Total Movement Responses  
(Movement Mentioned) and Personality

| Control        |        | Imagination etc. |         | Introversion   |         |
|----------------|--------|------------------|---------|----------------|---------|
| Scale          | Rho    | Scale            | Rho     | Scale          | Rho     |
| C              | + .088 | B                | + .279* | A              | — .047  |
| G              | + .079 | I                | — .084  | E              | — .212* |
| L              | — .159 | M                | + .067  | F              | + .035  |
| O              | + .060 | CI               | + .066  | Q <sub>2</sub> | + .091  |
| Q <sub>3</sub> | + .004 | TI               | + .050  | SA             | + .215  |
| Q <sub>4</sub> | + .005 |                  |         | Ws             | + .207  |
| Oi             | — .211 |                  |         | Pe             | — .353  |
| Ov             | — .127 |                  |         | EI             | — .106  |
| Ou             | — .009 |                  |         |                |         |
| Ac             | — .009 |                  |         |                |         |

\* $P = .05$  $N = 71$  (16PF sample) $N = 23$  (DPI sample)

These results constitute further support by hypotheses relating colour form and movement responsiveness to personality variables. Though hypothesis 1 relating to movement and control was not confirmed the negative correlation between factor L (16PF) protension and movement mentioned approached significance, and is in the predicted direction.

In line with results relating to comparison, free response and percentage scores, hypothesis 2 concerning form and introversion failed to gain support.

## APPENDIX B

### Subsidiary Results: Measures of Colour Form and Movement Responsiveness, Preference for Expressionism, Cubism and Futurism and Personality

The following results derive from the correlation matrix describing the intercorrelations of personality variables in relation to colour-form dominance, movement threshold, comparison, free response and percentage scores, and preference.

These results elucidate the various relationships reported in the main section, and in some cases add further weight to hypotheses already substantiated.

Although consigned to the appendix, it is considered that these results furnish valuable suggestions for further research.

Table 49 tabulates results pertaining to colour responsiveness and subsidiary personality scales on the 16PF and DPI.

Colour dominance (Keehn Test 1) correlates with N (16PF) shrewdness; tests 1-5 relate positively to S (DPI) sexuality and negatively to As (DPI) sadism. The first two scales relate to scales indicative of impulsivity — Ov (DPI) verbal aggression, and Oi (DPI) impulsivity respectively. The latter (As) relates to Ac (DPI) conservatism and inhibition. Hence these intercorrelations constitute further support for hypothesis 1 relating colour dominance to impulsivity.

Colour dominance on Keehn tests 1-5 also relates positively to Pa (DPI) achievement, and CI (DPI) creative interests.

Colour dominance as reflected by the Thurstone test relates negatively to two phallic scales: Pi (DPI) Icaran exploits and Pf (DPI) fire or sensual aspects of the Icaran complex.

Concerning responsiveness to paintings the colour comparison score was found to relate negatively to Aa (DPI) authority and H (DPI) hypocrisy. Both scales relate to non-impulsivity and inhibition — Ac (DPI) conservatism. This furnishes further support for hypothesis 1 relating colour responsiveness to impulsivity.

The positive correlation between colour comparison and H (16PF) *harria* suggests that colour responsiveness relates to either extraversion or stability, since it reflects both. This correlation may indicate further support for hypothesis 2 relating colour responsiveness to extraversion.

There are no subsidiary results pertinent to the free colour response score, but the colour percentage score relates to two scales indicative of introversive trends. The latter include imagination, intelligence, creative interests and social introversion. The scales are I (16PF) *premsia* and M (16PF) *autia*. It is noteworthy that factor M relates to Lüscher profile 7 indicative of aesthetic interests. These correlations, indicating a relationship of colour responsiveness and introversive tendencies constitute further evidence against hypothesis 2 (colour and extraversion) which was only tentatively supported by the marginal correlation found between colour percentage and factor A (16PF) *affectothymia*.

Since the colour percentage score was calculated to reflect propensity to grasp the significant and essential aspects of Expressionist paintings regardless of general colour reactivity, and this may involve aesthetic sensitivity, the correlation of this score and scales indicative of sensitivity and imagination is more intelligible.

In contrast to results pertaining to the colour percentage score are those relating to preference for Expressionism. Scales indicative of introversive propensity relate negatively to this score. Q<sub>1</sub> (16PF) radicalism, and M (16PF) autia. Hence preference for Expressionism relates to a realist, down to earth attitude, concrete thought, and probably social extraversion.

It is interesting that these traits, constituting the Rorschach concept of extratension, are reflected by colour responsiveness on Rorschach. Preference for Expressionism was found to relate to colour responsiveness on Rorschach.

Table 49

**Subsidiary Correlations for Measures of Colour Responsiveness, Preference for Expressionism, and Personality Inventory Scales (16PF and DPI)**

| Score       | 16PF                    | Scale and $x^2$ or $r^{\dagger}$  | DPI         |
|-------------|-------------------------|---|-------------|
| Keehn 1     | N : 3.87*               |   |             |
| Keehn 1-5   |                         |   | S : +.422*  |
|             |                         |   | Pa : +.388* |
|             |                         |   | CI : +.406* |
|             |                         |   | As : -.388* |
|             |                         |   | Pi : -.667* |
|             |                         |   | Pf : -.667* |
| Comparison  | H : +.209*              |   | Aa : -.402* |
|             |                         |   | H : -.468*  |
| %           | I : +.276**             |   |             |
|             | M : +.350**             |   |             |
| Preference  | Q <sub>1</sub> : -.216* |   |             |
|             | M : -.202*              |   |             |
| * $P = 0.5$ | ** $P = .01$            | $\dagger x^2$ is reported for Keehn Test 1: the other correlations Product Moment |             |

Results pertinent to form responsiveness are reported in table 50.

Form dominance (Keehn 1) related negatively to N (16PF0 shrewdness. Form dominance (Keehn 1-5) related negatively to S (DPI) sexuality and positively to As (DPI) sadism. This suggests a further

relationship of form dominance and non impulsivity.

Form dominance (Keehn 1-5) also related negatively to Pa (DPI) achievement and negatively to CI (DPI) creative interests.

Form dominance as reflected by Thurstone's test related negatively to Pi (DPI) Icaran exploits and Pf (DPI) fire.

Form responsiveness on Rorschach was found to relate positively to B (16PF) intelligence. This is anomalous, since among other things F responses on Rorschach are purported to indicate limited imaginal functions, rather than abstract ability.

Form comparison scores were not found to relate to any of the subsidiary scales.

Free form response scores related to H (16PF) harria, which probably indicates a relationship between form responsiveness and both extraversion and stability, since these two traits were found to relate to form responsiveness in the main results.

The negative correlation between free form response and Aa (DPI) authority, stands in contradiction to the finding that form responsiveness relates to non-impulsivity. Aa relates to inhibition (Ac) and negatively to emotionality (G (16PF) superego strength).

The form percentage score related negatively to fantasy aspects of the Icaran complex as reflected by Ph (DPI) height.

It related negatively to N (16PF) shrewdness, suggesting a relationship with non-impulsivity, since N reflects this to some extent.

Of more interest is the positive correlation found between the form percentage score and B (16PF) intelligence. This is suggestive, since Cubism emphasised the intellectual analysis of objects, and the form percentage score reflects propensity to grasp the significant aspects of Cubist works. It may be that the intellectual qualities inherent in Cubism demand intellectual analysis to precipitate appropriate response to Cubism reflected by the form percentage score.

It would seem apposite also to mention in this context the significant relationship found between B (16PF) intelligence and response to form in Cubist paintings in the pilot study (Appendix E). Hypotheses in the latter study were formulated directly in relation to the aesthetic of the art movement in question.

Preference for Cubism was found to relate to DPI scales indicative of creative feminine interests: F, femininity, Pn, narcissism, OA, oral aggression, and O, orality. It is also of interest that, congruent with the Cubist emphasis on the tactile and textural qualities of objects, preference for Cubism was found to relate to TI (DPI) tactile interests.

Table 50

Subsidiary Correlations for Measures of Form Responsiveness, and Preference  
for Cubism and Personality Inventory Scales (16PF and DPI)

| Score         | Scale and r  |              |
|---------------|--------------|--------------|
|               | 16PF         | DPI          |
| Keehn 1 †     |              |              |
| Keehn 1-5 †   |              |              |
| Rorschach F   | B : + .445*  |              |
| Free Response | H : + .198*  | Aa : - .490* |
| %             | N : - .238*  |              |
|               | B : + .298** | Ph : - .423* |
| Preference    |              | OA : + .438* |
|               |              | O : + .437*  |
|               |              | F : + .481*  |
|               |              | Pn : + .420* |
|               |              | Pa : + .445* |
|               |              | TI : + .413* |

\*  $P = .05$

\*\*  $P = .01$

† : For results pertaining to the Keehn measures of form dominance see table pertaining to colour dominance. Correlation coefficients for form dominance and personality factors are of the opposite sign to those for colour dominance and personality.

There are no subsidiary results (table 51) pertaining to movement threshold, but movement responsiveness on Rorschach which related to it related to Q<sub>1</sub> (16PF) radicalism, which bears a relation to the introversive tendencies of imagination and intelligence postulated vis a vis movement responsiveness. Cattell (1970) remarks that field independence may be an expression of the Q<sub>1</sub> factor.

Field independence (Child's Inventory) could not be related to Rorschach M responses since the subsamples differed, but this scale was found to relate to movement threshold. The ability to concentrate on a focal aspect of a complex field, regardless of irrelevant peripheral stimulation, may be an essential aspect of the movement response.

Q<sub>1</sub> was also found to relate to movement comparison and this score, as opposed to free response and percentage, related to Rorschach M and movement threshold.

Movement comparison also related to OA (DPI) oral aggression, which despite purported correlates, related to scales indicative of creative interests (CI and TI). Alongside the correlation found for movement comparison and Q<sub>1</sub> (16PF) radicalism this correlation provides further support for hypothesis 2a relating movement responsiveness to the introversive traits intelligence, imagination and creative interests.

The negative correlation found for movement comparison and Ai (DPI) insularity is difficult to

interpret. Ai reflects racial prejudice, but scale intercorrelates produced equivocal interpretations.

The free movement response score was found to relate to H (16PF) *harria*. Again this could mean that movement responsiveness relates to either extraversion or stability. Since free movement response was found to relate negatively to Pe (DPI) exhibitionism, this correlation probably furnishes support for hypothesis 1 linking movement responsiveness and stability. The movement percentage score was found to relate to N (16PF) shrewdness. This is further evidence against hypothesis 1 which was not confirmed for this score. Shrewdness relates to scales indicative of impulsivity.

The negative correlation found between movement percentage and Ai (DPI) insularity again is difficult to interpret. It is not clear (see Chapter 4) what Ai measures.

Preference for Futurism related negatively to Aa (DPI) authority and Ad (DPI) detail, and in so far as these scales reflect inhibition and non impulsivity, these correlations contradict hypothesis 1.

However, the main results furnished evidence for hypothesis 1 in so far as preference related to Q<sub>3</sub> (16PF) self-sentiment integration. Preference was also found to relate negatively to N (16PF) shrewdness, which reflects impulsivity to some extent. Also preference related to H (16PF) *harria*, which suggests a further relationship with stability.

Table 51

**Subsidiary Correlations for Measures of Movement Responsiveness,  
Preference for Futurism and Personality Inventory Scales (16PF and DPI)**

| <i>Score</i>     | <i>Scale</i><br><i>16PF</i> | <i>and</i>          | <i>r</i><br><i>DPI</i> |
|------------------|-----------------------------|---------------------|------------------------|
| Rorschach M      | Q <sub>1</sub> : + .595**   |                     |                        |
| Comparison       | Q <sub>1</sub> : + .279**   | OA : + .580**       |                        |
|                  |                             | Ai : - .515**       |                        |
| Free Response    | H : + .236*                 |                     |                        |
| %                | N : + .325***               | Ai : - .516**       |                        |
| Preference       | N : - .302**                | Ad : - .461*        |                        |
|                  | H : + .225*                 | Aa : - .420*        |                        |
| * <i>P</i> = .05 | ** <i>P</i> = .01           | *** <i>P</i> = .001 |                        |

Subsidiary results pertaining to perceptual style and personality are of interest for two reasons: firstly they often furnish further corroboration for hypotheses already substantiated; secondly, they suggest, in the case of hypothesis which failed, the type of factors to which different measures of perceptual style and preference do relate.

Further support was furnished for hypothesis 1 in relation to colour and form dominance. These



were found to relate to measures of impulsivity, colour positively and form negatively. These measures were N (16PF) shrewdness, and S (DPI) sexuality. Conversely colour dominance related negatively and form dominance positively to As (DPI) sadism, which relates to inhibition.

The correlations found between free form response and extraversion in the main results (confirming hypothesis 1 and disconfirming hypothesis 2) were substantiated by the finding that free form response related to factor H (16PF) *harria*, which measures both stability and extraversion.

Hypothesis 2a relating Rorschach M and movement comparison to the introversive tendencies of imagination and intelligence was further substantiated by the correlation between these scores and Q<sub>1</sub> (16PF) radicalism or experimental thought.

The negative correlation found between preference for Futurism and N (16PF) shrewdness further supports the confirmation of hypothesis 1 relating preference for Futurism to control.

Correlations which emerged for scores which failed to relate to the hypotheses related especially to percentage and preference scores.

For colour percentage, only hypothesis 1 was confirmed. Hypothesis 2, relating to colour and extraversion may have failed because this score would seem to relate to factors reflecting introversive traits, like imagination, subjectivity and perhaps introversion (I (16PF) *premsia* and M (16PF) *autia*). The fact that the percentage score is purported to reflect appropriate response to the essence of a painting may explain why imagination and sensitivity do relate, and are in fact necessarily connected to this score.

Hypothesis 2, relating colour to extraversion, was not supported with reference to preference for Expressionism. It was found that preference did relate to factors indicative of extratension, however, which involves extraversion: that is low scores on Q<sub>1</sub> (16PF) radicalism and M (16PF) *autia*. It would seem at least safe to conclude that preference for Expressionism relates to a realist, down-to-earth, concrete mode of thought.

Hypotheses 1 and 2 failed to be confirmed in relation to the form percentage score. It was found that this score related to intelligence. If this score is measuring appropriate response to Cubism, then since Cubism involves, as part of its aesthetic, intellectual analysis of objects, abstract thinking capacity may well relate to grasp of its essentials.

Preference for Cubism did not relate to hypothesised personality variables. It was found, in subsidiary results, to relate more to creative and tactile interests. Since Cubism involved emphasis on the tactile significance of objects, the finding that preference for Cubism involves an interest in tactile qualities is understandable.

When the hypotheses derived from Rorschach studies were applied to preference for Expressionism, Cubism and Futurism, they were not all substantiated. Two hypotheses were confirmed. Preference for Futurism was found to relate to control of emotionality, which confirms hypothesis 1 for movement.

Preference for colour in pictures, and preference for colour over tint, had been found to relate

to emotionality in previous studies (Cerbus and Nichols, 1963) (Barrett and Eaton, 1946). This study furnishes evidence for preference for Expressionism, an art form considered to depend on colour primarily for its effect, and emotionality.

Subsidiary results suggest that preference for the various movements do relate to personality factors but not those hypothesized.

Preference for Expressionism, which related to emotionality, as hypothesized, also related to factors indicative of a realist, down to earth, conservative attitude. It related negatively to Q<sub>1</sub> (16PF) radicalism, and M (16PF) autia.

Preference for Cubism related to DPI scales indicative of creative, feminine interests: OA oral aggression, O orality, F femininity and Pn narcissism. Preference for Cubism also related to an interest in objects of tactile significance (TI (DPI) tactile interests).

This is interesting, since the Cubist painters were concerned with the textural and tactile qualities of objects.

Preference for Cubism, while relating to control of emotionality, as hypothesized, also related to scales indicative of unconventionality of interests, and, to some extent, impulsivity. It related positively to Ou (DPI) unconventionality, N (16PF) shrewdness, and negatively to Aa (DPI) authority and Ad (DPI) detail.

Preference for different movements in art also relate to various facets of cognitive style (see table 45).

Preference for Expressionism related to levelling, or tendency to minimize in awareness over time differences between objects and stimuli. Hence preference for Expressionism would seem to relate to a global approach to classification of events. If preference for Expressionism can be regarded as preference for colour in a painting, as it is contended, this result is interesting in the light of Keehn's work (1953) with colour-form dominance tests and Rorschach. Keehn suggests that the colour response to Rorschach depends more on global and synthetic articulation of the stimulus rather than to colour qua colour. He suggests that responses scores as colour responses are only so determined if the subject's initial reaction is to the Rorschach ink blot as a whole. In his study, Keehn found that the Rorschach measured along the same dimension as Lindberg's Ring Test (1950) which measures a whole-part attitude. In this study, in line with this finding, preference for a stimulus the primary attribute of which is colour would seem to relate to a global versus analytical attitude. It is noteworthy too (as will be discussed below) that preference for Expressionism related to Rorschach colour responsiveness.

Preference for Cubism related to the opposite attitude to that of levelling — that is, sharpening. This means that preference for emphasis on form in a painting is associated with a tendency to maximize through time, awareness of differences in stimuli and events. Hence, whereas preference for colour in a painting relates to a global or synthetic attitude, preference for form in a painting relates to a piecemeal

or analytical attitude. Preference for Cubism also related to flexibility, or the ability to restructure thinking when appropriate. Since Cubism involves as its aesthetic ideas about multiple views of objects through space and time, a flexible approach in viewing a Cubist work may well be an advantage. The correlation between flexibility and preference for Cubism suggests that an attitude which corresponds to Cubist ideas relates to preference for this art form.

Preference for Futurism was found to relate to scanning, or the ability to focus on one focal aspect of a stimulus while tracking changes in peripheral stimulation. Scanning involves the simultaneous articulation of a very complex field. It was found by Child to relate to aesthetic judgement. Scanning may well involve a high degree of imagination, and aesthetic sensitivity, and these factors, relating as they probably do to the introversive traits of imagination, intelligence, and creative interests and stability, have been shown to relate to movement responsiveness and hence may well relate to a stimulus which facilitates such responsiveness.

## APPENDIX C

### Rorschach Ratios in Relation to Colour Form and Movement Responsiveness, and Preference for Paintings

Various Rorschach ratios indicative of personality traits were derived from 20 Rorschach protocols. Since this study was an attempt to test Rorschach hypotheses concerning Rorschach determinants using different measures of colour, form and movement responsiveness including Rorschach, in relation to inventory, or objective personality measures, Rorschach could not be included in the analysis alongside the 16PF and DPI as a personality test per se.

Results bearing upon Rorschach measures of perceptual style were reported in two sections: the relation of Rorschach to questionnaire measures of personality; and the relation of Rorschach to other measures of colour, form and movement responsiveness and preference for paintings. These analyses and results involved straight counts of Rorschach CF and C, F, and M responses as measures of perceptual style.

The Rorschach measures pertaining to personality diagnosis are ratios; that is, they pit one determinant against another. The relationship of these ratios (as opposed to straight counts) with the 16PF was reported in Chapter 4 Section 1, concerning scale intercorrelations.

Results pertaining to these ratios, and their relation to the scores reflecting perceptual style (which is the concern of this section) are tabulated in table 52.

The ratio  $M : FM + m$  indicating the control-impulsivity balance was found to relate to colour-form dominance (Keehn test 1).  $M$  balance related to form predominance and  $FM + m$  balance to colour dominance. Hence in line with hypothesis 1 relating to colour-form and impulsivity, colour dominants are impulsive, form dominants controlled.

The only other score which related to this ratio was the free movement response score, which, in line with the prediction from hypothesis 1, related to  $M$  predominance, indicating control. The chi square was of marginal significance, however.

The other ratio indicative of control-emotionality  $FC : CF + C$  related to three scores.  $FC$  predominance related to form percentage and preference for Cubism. Hence hypothesis 1 relating to form and control, which was not corroborated by 16PF and DPI measures, receives some support from the Rorschach ratio.  $FC$  predominance also related to preference for Futurism, though the significance level was under .05. This is further confirmation of hypothesis 1 relating preference for Futurism to control of emotionality.

The  $M : \text{Sum } C$  ratio could only be directly hypothesized in relation to movement responsiveness, since it involves a two-pronged prediction concerning the introversive traits of imagination, intelligence, creativity and social introversion.  $M$  predominance on this ratio was found to relate to movement threshold; this is in line with hypothesis 2a and 2b, relating movement responsiveness to introversive traits.

C predominance on the M : Sum C ratio was found to relate to preference for Expressionism. This suggests that preference for Expressionism relates to extratensive traits: realism, concrete thought and extraversion. This is some tentative support for hypothesis 2 relating preference for Expressionism to extraversion. It is also in line with the subsidiary finding reported in Appendix B; preference for Expressionism was found to relate negatively to Q<sub>1</sub> (16PF) radicalism and M (16PF) autia, both indicative of introversive tendencies.

Further support is furnished by Rorschach correlations for the confirmation of hypothesis 1 relating to colour-form dominance. Colour dominance was found to relate to impulsivity, and form dominance to control, as indicated by the Rorschach ratio M : FM + m.

For free movement response further support was gleaned for hypothesis 1 relating to control (M predominance related to free movement response on the M : FM + m ratio). Further support was forthcoming for the relationship of preference for Futurism and control (hypothesis 1) in so far as this related to FC predominance on the ratio FC : CF + C. Further confirmation was also found for hypotheses 2a and 2b and preference for Futurism. The latter related to M predominance on the M : Sum C ratio indicative of introversive tendencies.

Though no support had been found for hypothesis 1 relating form responsiveness to control in relation to the form percentage and preference for Cubism scores, the relation found between these and FC predominance on the FC : CR + C ratio is tentative support, at least.

For hypotheses that failed, a suggestive explanation emerges from these results in relation to preference for Expressionism. Hypothesis 2, relating this score to extraversion, was not confirmed, but this score was found to relate to Sum C predominance on the Rorschach M : Sum C ratio. This suggests that preference for Expressionism relates to extratension: realism, concrete thought and extraversion. This result is in line with that found in subsidiary correlations reported in Appendix B. Preference for Expressionism was found here to correlate negatively with scales indicative of introversive tendencies: Q<sub>1</sub> (16PF) radicalism and M (16PF) autia.

Table 52

**Significant Chi Squares for Rorschach Ratios and Measures of Colour Form,  
and Movement Responsiveness and Preference for Paintings**

| <i>Rorschach Ratios</i> | <i>Colour-Form Dominance (Keehn 1)</i> | <i>Movement Threshold</i> | <i>Form %</i> | <i>Movement Free Response</i> | <i>Preference for Expressionism</i> | <i>Preference for Cubism</i> | <i>Preference for Futurism</i> |
|-------------------------|--|---------------------------|---------------|-------------------------------|-------------------------------------|------------------------------|--------------------------------|
| M : FM + m              | .4.42*                                 |                           |               | 3.07*                         |                                     |                              |                                |
| FC : CF + C             |  |                           | 3.98*         |                               |                                     | 6.06**                       | 3.05*                          |
| M : Sum C               |  | 6.64**                    |               |                               | 3.25*                               |                              |                                |

\*  $P = .05$  (one tail)

\*\*  $P = .01$  (one tail)

$N = 20$

## APPENDIX D

### The Lüscher Test in Relation to Perceptual Style and Preference for Paintings

Easy and swift administration of the Lüscher test recommended its inclusion, for exploratory reasons, in the main test battery. It was administered to all 71 subjects.

The test was scored according to instructions set out in the manual (1970) and reported in Chapter 3 Section C where the personality descriptions which emerged were also reported.

Intercorrelations of Lüscher and scales on the 16PF and DPI were reported in Chapter 4, Section

1. Lüscher personality profiles were not found to have much in common with questionnaire measures of similar traits.

Results are tabulated in table 53. Lüscher profile 1, indicative of introversion and withdrawal from involvement, related to the form comparison score. This resulted when profile 1 was pitted against profile 5, indicative of ambitious, outgoing behaviour. Failure to confirm hypothesis 2 concerning form responsiveness and introversion had been the case for all scores reflecting form responsiveness except form dominance (and form responses on Rorschach, though this is out of line with past failures to confirm hypothesis 2 using Rorschach). The form comparison score would therefore seem to relate to the type of introversion measured by Lüscher, which may possibly be because this measure does not reflect the anxiety which is normally measured alongside introversion by questionnaire measures.

Colour comparison scores related to Lüscher profile 6, sensitivity and emotionality, when this was contrasted with profile 2, inhibition. This is further support for a hypothesis which has been corroborated using many measures of colour responsiveness and emotionality.

All three hypotheses in relation to movement responsiveness gleaned support from the Lüscher measures. The movement comparison related to profile 1, introversion, and negatively to profile 6, emotionality. This is support for hypothesis 1 relating movement responsiveness to control, Hypothesis 2a was supported in so far as movement comparison related to profile 7, indicating subjectivity, aesthetic sensitivity and imagination when this was pitted against profile 5 indicating ambitious outgoing traits. Hypothesis 2b was supported. Profile 1, introversion, when pitted against three Lüscher profiles indicative of extraversion (3, 4 and 5) related to the movement comparison score.

Table 53

Significant Chi Squares for Lüscher Personality Profiles and  
Colour, Form and Movement Comparison Scores

| <i>Profiles</i> | <i>Colour</i> | <i>Form</i> | <i>Movement</i> |
|-----------------|---------------|-------------|-----------------|
| 1 : 5           |               | 6.467**     |                 |
| 2 : 6           | 5.25*         |             |                 |
| 1 : 6           |               |             | 5.97**          |
| 5 : 7           |               |             | 4.04**          |
| 1 : 3           |               |             | 5.07*           |
| 1 : 4           |               |             | 6.07**          |
| 1 : 5           |               |             | 6.04**          |

\*  $P = .05$  (one tail)    \*\*  $P = .01$  (one tail)     $N = 71$

Correlations between the Lüscher test and perceptual style therefore offer support for five hypotheses.

Hypothesis 1 relating colour comparison to emotionality gains further support. This hypothesis has been substantiated using a wide variety of tests.

Hypothesis 2 relating to form and introversion is supported by the correlation of form comparison and Lüscher profile 1. This hypothesis has only been confirmed for form dominance, and support from this study was forthcoming for form responses to Rorschach, though it has not had much, if any, prior substantiation (see Chapter 2).

All hypotheses relating to movement comparison scores were supported by Lüscher profiles.

It is interesting to speculate about the affiliation of Lüscher and comparison scores. In each case of hypothesis substantiation for Lüscher profiles and colour form and movement hypotheses, it is the comparison score which relates to Lüscher profiles.



## APPENDIX E

### Pilot Study

Essentially this study was carried out in order to see if there was any relationship between response to certain aspects of a painting, preference for paintings and personality. It was an exploratory attempt to relate response to "appropriate" aspects of paintings to personality variables. Appropriateness was defined as response to those aspects of the painting considered essential to the aesthetic of the art movement to which the painting belonged, by the artists themselves, or by art critics and historians. The aim of the study was to reveal any trends which might suggest an interrelation of responses to certain aspects of paintings, preference and personality; for this reason the study was carried out on a broad scale, in so far as it involved many movements in art. These movements were: Pre-Impressionism (Corot, Turner, Constable), Impressionism (Monet, Sisley, Pissarro), Post Impressionism (Seurat, Degas, Gauguin), Fauvism (Matisse, Braque\*), Expressionism (Nolde, Schmidt-Rottluff, Modersohn-Becker), Purism (Ozenfant, Corbusier), Cubism (Braque, Picasso, Gris), Orphism (Delaunay, Villon), Futurism (Severini, Boccioni), Blaue Reiter (Klee, Jawlensky, Marc), Surrealism (Dali, Magritte, Miró, Chirico), and Neo-Plasticism (Mondrian).

Forty colour slides representative of these movements and painted by the artists named above in parenthesis were shown to 20 subjects. Subjects were asked to speak freely about the paintings, and rated the paintings on a 7-point scale ranging from "like" to "dislike". They also completed the 16PF.

Though it often proved difficult to provide criteria for appropriateness of response to various movements, a response was considered appropriate, and score, if, for example, subjects described Impressionism in terms of colour and atmosphere, Post-Impressionism in terms of form and design, and Pre-Impressionism in terms of figurative aspects and techniques like linear perspective. Pertinent to the main study is the fact that appropriate responses to Expressionism and Fauvism were colour responses, to Cubism and Neo Plasticism, form responses, and to Orphism and Futurism, responses describing movement and dynamism.

Various vague hypotheses concerning responsiveness, preference and personality were borne in mind; none were specifically delineated. Hypotheses were suggested by both the aesthetic of the movement in question and Rorschach experiments, but the latter in particular had not been analysed in detail, in order to derive specific hypotheses. In relation to a movement's aesthetic, it was considered, for example, that if Cubism was an attempt intellectually to analyse and portray the form of objects in space, then a person habitually given to intellectual analysis (of high intelligence) would be more likely to respond to the formal aspects of Cubism, and perhaps also to prefer Cubism.

At the same time rationale derived from Rorschach experiments led to the hypothesis that colour

\* Before working with Picasso, and becoming involved with Cubism, Georges Braque painted several pictures in the Fauve idiom (1905). One was used in this study.

responses would relate to emotionality, for example.

Because of the number of paintings and art movements involved, vague hypotheses, like those suggested above, were a guide as to which personality factors to relate to responses to and preference for the movements. Several relationships which might have emerged, therefore, were often not postulated. Insufficient attention to Rorschach studies, for example, meant that at this stage the relationship between imagination intelligence and movement responses was not studied.

## Results

From the relationships studied, several significant correlations emerged for preference for an art movement and personality. For example, extraversion was found to relate positively to preference for Pre-Impressionism (Corot, Constable) ( $r = +.50$ ), and negatively to preference for Neo Plasticism (Mondrian) ( $r = -.38$ ). Both correlations were significant. This result is in line with results derived from other studies\* which also found that extraversion was associated with preference for traditional and introversion with preference for modern, abstract paintings. Results pertaining to preference for movements other than those also involved in the main study are not reported.

The only significant results pertaining to response to certain aspects of paintings were those in relation to Expressionism and Fauvism (grouped together as both involved colour responses) Orphism and Futurism (grouped together as they involved movement) Cubism, and Neo Plasticism (analysed separately because even though form responses were scored for both, Neo Plasticism involves a much more esoteric and complex theory).

Results are reported in tables 54, 55, 56 and 57. Significant relationships only are reported; these were: colour responsiveness and extraversion (F, surgency; H, harria); form responsiveness and intelligence (B); and movement responsiveness and control (C, ego strength) concerning preference: preference for Cubism related to control (low scores on O guilt-proneness); preference for Neo Plasticism to introversion (low A affectothymia), intelligence (B) and experimental thought ( $Q_1$ ); and preference for Futurism related to introversion (low A affectothymia).

Table 54

### Rank Correlation Coefficients for Colour Responses to Fauvism and Expressionism and Personality

| <i>Personality Factor</i> | <i>Rho</i> |
|---------------------------|------------|
| F                         | + .30*     |
| H                         | + .29*     |
| * P .05                   | N = 20     |

\* See Peters (1942) for a summary of studies pertinent to this.

Table 55

Rank Correlation Coefficients for Form Responses to and  
Preference for Cubism and Personality

| <i>Personality Factor</i> | <i>Form Responses</i> | <i>Personality Factor</i> | <i>Preference for<br/>Cubism</i> |
|---------------------------|-----------------------|---------------------------|----------------------------------|
| B                         | + .64**               | O                         | - .37*                           |
| * $P = .05$               | ** $P = .01$          |                           | $N = 20$                         |

Table 56

Rank Correlation Coefficients for Form Responses to and  
Preference for Neo Plasticism and Personality

| <i>Personality Factor</i> | <i>Form Responses</i> | <i>Personality Factor</i> | <i>Preference for<br/>Neo Plasticism</i> |
|---------------------------|-----------------------|---------------------------|--|
| B                         | + .47*                |                           |  |
| Q <sub>1</sub>            | + .44*                | B                         | + .30*                                   |
|                           |                       | Q <sub>1</sub>            | + .39*                                   |
|                           |                       | A                         | - .38*                                   |
| * $P = .05$               | $N = 20$              |                           |  |

Table 57

Rank Correlation Coefficients for Movement Responses to and  
Preference for Orphism and Futurism and Personality

| <i>Personality Factor</i> | <i>Movement Responses</i> | <i>Personality Factor</i> | <i>Preference for<br/>Orphism and<br/>Futurism</i> |
|---------------------------|---------------------------|---------------------------|--|
| C                         | + .42*                    | A                         | - .34*   |
| * $P = .05$               | $N = 20$                  |                           |  |

Though these results were not derived from clear-out hypotheses they were an incentive to further study of the movements concerned, and they obviously foreshadow the results derived from the main study.

Fauvism, Neo Plasticism and Orphism were not included in the main study. This was because the aesthetic involved in Fauvism is essentially a prodramata to Expressionism, and the latter is therefore a purer expression of involvement with colour. Similarly Orphism was an offshoot of Futurism which is a more single-minded attempt to portray movement. Neo Plasticism, in a highly complex philosophy, and

also seeks to express many aspects of a theory which Cubism does not involve.

Hence, Expressionism, Cubism, and Futurism were singled out for further exploration, because their aesthetics were clearly established, and because the pilot study had furnished suggestive trends worthy of further exploration. Moreover, their emphasis on colour, form and movement suggested an analogy with the emphasis placed by Rorschach demonstrations on the determinants of colour, form and movement in relation to specific personality factors. Results from the pilot study were a spur to clarification of these hypotheses within a theoretical framework which could amalgamate responsiveness to all perceptual stimuli in relation to personality.

## APPENDIX F

### Glossary of Rorschach Terms

This section comprises a list of definitions of Rorschach scores or symbols used in the text. Only those scores which have direct bearing on the Rorschach hypotheses related to this study are delineated. The system of scoring followed is that outlined by Klopfer (1954).

#### Colour

A colour response is scored when the subject uses the chromatic aspects of the ink blot in forming a concept.

- CF** This is scored when the object seen by the subject is inspired by the colour, and is of vague or indefinite form.
- C** There are various subcategories of the colour-determined response scored C, but in general C is scored when the subject responds to the colour in a blot without any reference to any object or form.

#### Form

A form response is scored when the subject has used the form in an ink blot to identify an object of definite shape.

- FC** This score is included under colour responses in Klopfer's outline of the Rorschach scoring system. The implications of this response for personality diagnosis are like those for F and F +, rather than for CF and C and hence it is included here and in Chapter 3 under the form rubric. FC is scored when the subject identifies coloured objects of definite form, and the colour used is that of the object in its natural state. Hence form has been fully integrated with the colour of an object.
- F** This is scored when form has been the only determinant of the response. Klopfer states that F is scored for all responses when there is no other main determinant.
- F +** When colour or movement do not enter into the concept, F + is scored, as long as the form level rating of the concept is high. This means that the shape referred to in the blot closely corresponds to the object conceptualised in the response, as indicated by the degree to which the object is clearly specified. F – responses are not included in the studies cited in Chapter 3 relating form responses to control, as it indicates low form level or a loose identification of the shape of the blot and the object perceived. It reflects a response relating to indefinite form, and does not have the same implications for personality diagnosis as F, FC or F +.
- Fc** This is scored when a subject responds to the shading in an ink blot, and the object, determined by shading, is of definite form. Hence Fc, though reflecting response to textural

aspects of a configuration, indicates a controlled response to the form perceived in an ink blot. It has been studied in the context of form responses to Rorschach for this reason.

### **Movement**

A movement response is scored when a subject has attributed some kind of movement to the ink blot. Movement responses are subdivided according to whether the movement seen is attributed to human, animal figures, or inanimate objects.

**M** This is scored when human beings are seen in action.

**FM** This is scored when animals are seen in action, or lifelike posture. This response does not have the same implications for personality diagnosis as M, and to a lesser extent, m.

**m** This is scored when the subject sees a moving inanimate object or force.

## APPENDIX G

### Glossary of Personality Variables

#### 1. 16PF

|                       |  |
|-----------------------|--|
| Factor A              | Schizothymia versus Affectothymia                    |
|                       | Cool, aloof versus warm, outgoing                    |
| Factor B              | Low intelligence versus high intelligence            |
| Factor C              | General instability versus ego strength              |
|                       | Emotional, impulsive versus mature                   |
| Factor E              | Submission versus dominance                          |
|                       | Dependent versus self-assertive                      |
| Factor F              | Desurgency versus surgency                           |
|                       | Taciturn versus cheerful, outgoing                   |
| Factor G              | Low superego strength versus high superego strength  |
|                       | Fickle, impatient versus persevering                 |
| Factor H              | Threctia versus Parmia                               |
|                       | Cautious, withdrawn versus bold                      |
| Factor I              | Harria versus Premsia                                |
|                       | Realistic, independent versus sensitive, imaginative |
| Factor L              | Alaxia versus Protension                             |
|                       | Composed, adaptable versus mistrusting               |
| Factor M              | Praxernia versus Autia                               |
|                       | Practical versus imaginative                         |
| Factor N              | Naivete versus shrewdness                            |
|                       | Simple versus worldly                                |
| Factor O              | Adequacy versus guilt-proneness                      |
|                       | Confident versus insecure                            |
| Factor Q <sub>1</sub> | Conservatism versus radicalism                       |
|                       | Cautious versus experimental                         |
| Factor Q <sub>2</sub> | Group dependence versus independence                 |
| Factor Q <sub>3</sub> | Low self-sentiment versus high self-sentiment        |
|                       | Unstable, impulsive versus controlled                |
| Factor Q <sub>4</sub> | Low ergic tension versus high ergic tension          |
|                       | Calm versus anxious                                  |



## 2. D.P.I.

### Oral Scales

|    |                   |                                   |
|----|-------------------|-----------------------------------|
| O  | Oral              | Impulsivity, sociability          |
| OA | Oral Aggression   | Hostility, impulsivity            |
| Od | Dependence        | Emotional warmth, conventionality |
| Om | Movement          | Independence                      |
| Ov | Verbal Aggression | Impulsivity, confidence           |
| Oi | Impulsiveness     | Spontaneity, flexibility          |
| Ou | Unconventionality | Unusual interests, impulsivity    |

### Anal Scales

|    |                      |                                  |
|----|----------------------|----------------------------------|
| Ah | Hoarding             | Planning ability, responsibility |
| Ad | Attention to Details | Obsessive, orderly, confidence   |
| Ac | Conservatism         | Inhibition, control              |
| Aa | Authority            | Submissive                       |
| As | Sadism               | Authoritarianism                 |
| Ai | Insularity           | Reserve, prejudice               |

### Phallic Scales

|    |                 |                          |
|----|-----------------|--------------------------|
| P  | Phallic Symbols | Self-confidence          |
| Pn | Narcissism      | Enjoyment of luxury      |
| Pe | Exhibitionism   | Confidence, extraversion |
| Pa | Ascension       | High aspiration level    |
| Ph | Height          | Fantasy aspirations      |
| Pf | Fire            | Sensuality, sensitivity  |
| Pi | Icaran Exploits | Confidence, daring       |

### Womb Fantasy

|    |           |                  |
|----|-----------|------------------|
| Wp | Passivity | Need for comfort |
| Ws | Seclusion | Introspection    |

### Sexuality and Creativity

|    |                       |                            |
|----|-----------------------|----------------------------|
| S  | Sexuality             | Ego strength, sexual drive |
| TI | Tactile Interests     | Fluency                    |
|    | Imaginative Interests | Imagination, intelligence  |

|    |                    |                           |
|----|--------------------|---------------------------|
| CI | Creative Interests | Imagination, intelligence |
| M  | Masculinity        | Self-reliance             |
| F  | Femininity         | Caution, dependence       |

#### Ego Strength

|    |                      |                  |
|----|----------------------|------------------|
| EP | Persistence          | Maturity         |
| EI | Initiative           | Self-reliance    |
| SA | Social Activities    | Extraversion     |
| C  | Interest in Children | Emotional warmth |
| H  | Hypocrisy            | Conformity       |

### 3. LÜSCHER PROFILES

1. Withdrawal, social introversion
2. Inhibition
3. Group dependence
4. Social extraversion
5. Ambitious, outgoing, emotionally shallow
6. Emotional Sensitivity
7. Aesthetic Sensitivity

### 4. RORSCHACH RATIOS

|             |  |
|-------------|--|
| M : FM + m  | Non Impulsivity : Impulsivity  |
| FC : CF + C | Emotional Control : Impulsivity  |
| M : Sum C   | Erlebnistyp ratio  |
|             | Introversion : Extraversion  |
|             | Imagination, intelligence, introversion versus Realism, concrete thought, outgoing behaviour |
| F %         | Inhibition, imaginal constriction  |

### 5. COGNITIVE STYLES

|                     |  |
|---------------------|--|
| Field Independence: | Ability to maintain focus of attention, despite irrelevant attention-demanding stimulation |
| Regression:         | Controlled regression to less mature modes of thought                                      |
| Flexibility:        | Ability to change focus of attention when conditions make it appropriate                   |

|                                     |  |
|-------------------------------------|--|
| Narrowness of<br>Equivalence Range: | Tendency to react distinctively to stimuli which are only slightly different                 |
| Scanning:                           | Broad deployment of attention and peripheral awareness while focusing<br>on principle events |
| Sharpening:                         | Keen awareness of differences at time of occurrence and in later recall                      |

# APPENDIX H

## Calculation of Deviation from Expectation for Comparison and Free Response Scores

### COMPARISON SITUATION

There were 12 comparison situations in which two paintings related to one art movement, and one related to another, as opposed to one from each. Subjects could therefore make 12 "guesses" as to whether they differed (two were alike and one different) in terms of colour, form or movement. If a subject guessed randomly from a choice of three alternatives he would get four out of 12 guesses correct; he therefore had a one-in-three chance of guessing colour, form or movement. The formula for calculating the deviation from random guesswork is outlined below with calculations.

### Free Response Situation

If subjects responded randomly in terms of colour, form and movement for all paintings alike it is to be expected that the colour responses, for example, would be as high for Cubism and Futurism as they were for Expressionism, and so on, mutatis mutandis for Cubism and Futurism. Therefore from all the colour responses made to all paintings a third would be expected by chance to occur in relation to Expressionism. Hence the deviation from this chance expectation could be calculated for colour, form and movement responses in relation to Expressionist, Cubist and Futurist paintings respectively. Formula and calculations are given below.

### Formula:

$$\begin{aligned} \text{CR} &= \frac{\text{Deviation from Chance Expectation}}{n p q} \\ \text{(Critical Ratio)} & \\ n &= \text{number of guesses} \\ p &= \text{proportion expected "correct" by chance} \\ q &= \text{proportion expected "wrong" by chance} \end{aligned}$$

### COMPARISON SCORES

#### Colour

|               |                   |           |           |
|---------------|-------------------|-----------|-----------|
| $np = 187.3$  | $n = 562$         | $p = 1/3$ | $q = 2/3$ |
| $npq = 124.8$ | Responses correct | $= 233$   |           |
| $npq = 11.2$  | Deviation         | $= 45.7$  |           |
| C.R. = 4.08   | P                 | .001      |           |

**Form**

|      |   |      |                   |   |      |   |   |     |   |   |     |
|------|---|------|-------------------|---|------|---|---|-----|---|---|-----|
| np   | = | 116  | n                 | = | 348  | p | = | 1/3 | q | = | 2/3 |
| npq  | = | 77.2 | Responses correct | = | 140  |   |   |     |   |   |     |
| npq  | = | 8.8  | Deviation         | = | 24   |   |   |     |   |   |     |
| C.R. | = | 2.7  | P                 |   | .007 |   |   |     |   |   |     |

**Movement**

|      |   |      |                   |   |       |   |   |     |   |   |     |
|------|---|------|-------------------|---|-------|---|---|-----|---|---|-----|
| np   | = | 65   | n                 | = | 175   | p | = | 1/3 | q | = | 2/3 |
| npq  | = | 43.2 | Responses correct | = | 122   |   |   |     |   |   |     |
| npq  | = | 6.6  | Deviation         | = | 57    |   |   |     |   |   |     |
| C.R. | = | 8.63 | P                 |   | .0001 |   |   |     |   |   |     |

**FREE RESPONSE SCORES****Colour**

|      |   |       |                   |   |      |   |   |     |   |   |     |
|------|---|-------|-------------------|---|------|---|---|-----|---|---|-----|
| np   | = | 204.6 | n                 | = | 614  | p | = | 1/3 | q | = | 2/3 |
| npq  | = | 136.6 | Responses correct | = | 262  |   |   |     |   |   |     |
| npq  | = | 11.7  | Deviation         | = | 57.4 |   |   |     |   |   |     |
| C.R. | = | 4.9   | P                 |   | .001 |   |   |     |   |   |     |

**Form**

|      |   |      |                   |   |       |   |   |     |   |   |     |
|------|---|------|-------------------|---|-------|---|---|-----|---|---|-----|
| np   | = | 79.6 | n                 | = | 239   | p | = | 1/3 | q | = | 2/3 |
| npq  | = | 26.5 | Responses correct | = | 131   |   |   |     |   |   |     |
| npq  | = | 5.14 | Deviation         | = | 51.4  |   |   |     |   |   |     |
| C.R. | = | 10   | P                 |   | .0001 |   |   |     |   |   |     |

**Movement**

|      |   |      |                   |   |       |   |   |     |   |   |     |
|------|---|------|-------------------|---|-------|---|---|-----|---|---|-----|
| np   | = | 65   | n                 | = | 195   | p | = | 1/3 | q | = | 2/3 |
| npq  | = | 43.2 | Responses correct | = | 139   |   |   |     |   |   |     |
| npq  | = | 6.6  | Deviation         | = | 74    |   |   |     |   |   |     |
| C.R. | = | 11.1 | P                 |   | .0001 |   |   |     |   |   |     |

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